INDIA RUBBER WORLD

SYNTHETIC

NOVEMBER, 1946

NOV 22 1946
DETROIT

CONSISTENTLY SUPERIOR SINCE 1882

Sterling-S*

LOW HEAT GENERATION • HIGH RESILIENCE • HIGH LOADING

*SRF (SEMI-REINFORCING FURNACE BLACK)

CABOT

GODFREY L. CABOT, INC. BOSTON 10, MASSACHUSETTS

DU PONT ANNOUNCES

A new technical service laboratory in Akron, Ohio

PROVIDING EVEN BETTER TECHNICAL SERVICE TO RUBBER MANUFACTURERS

The construction of a new Rubber Laboratory in Akron, Ohio, is part of Du Pont's program to bring its laboratory facilities and technical personnel in closer contact with rubber manufacturers, in order to improve and speed up service to the industry.

The new laboratory provides the Midwest rubber industry with equipment and personnel for product development, technical investigation, service compounding and testing—on either natural rubber or synthetic elastomers. A complete latex laboratory has been installed for handling all phases of work on rubber or synthetic latices. So that full advantage may be taken of research developments, the Akron technical staff will work in close cooperation with the Rubber Laboratory at the Chambers Works at Deepwater, N. J.

As an added convenience to the trade, emergency stocks of rubber chemicals will be carried in the new building, which also includes modern offices for the Akron Branch sales personnel.

With the completion of the new laboratory, warehouse and sales offices at 40 E. Buchtel Avenue at High Street, Akron, Ohio, the Rubber Chemicals Division of Du Pont now offers improved service to rubber manufacturers in that area. The trade is cordially invited to inspect the new service center at any time, and to make full use of its laboratory facilities and technical personnel in working out development or manufacturing problems.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

DU PONT
Rubber Chemicals

E. I. du Pont de Nemours & Co. (Inc.)
Wilmington 98, Del.

INDIA RUBBER WORLD, November, 1946, Vol. 115, No. 2. Published Monthly by BILL BROTHERS PUBLISHING CORP. Office of Publication, Orange, Conn., with Editorial and Executive Offices at 386 Fourth Avenue, New York 16, N. Y., U. S. A. Entered as Second-Class Matter at the Post Office at Orange, Conn., under the act of March 3, 1879. Subscription, United States and Mexico, $3.00 per Year; All Other Countries, $4.00; Single Copies 35 Cents. Address Mail to New York Office.

SUPERIOR ABRASION RESISTANCE

Parts made from HYCAR synthetic rubber have 50% greater abrasion resistance than parts made from natural rubber. That means they'll last longer, give more dependable performance in the most severe service, and save maintenance and replacement time.

But that's only one of HYCAR's unusual and valuable properties. Examine the list in the box at the right. Think of these properties in terms of your requirements of rubber parts. Realize that these properties may be had in an almost limitless number of combinations, each designed to meet the specific service conditions of the finished part.

We have developed more than 5000 recipes for HYCAR compounds — each compound engineered to do a certain job. If you're looking for rubber parts that will give long life, dependability, and economical operation, *specify HYCAR.*

Ask your supplier for parts made from HYCAR. Test them in your own applications, difficult or routine. You'll learn for yourself that it's wise to use HYCAR for long-time, dependable performance. For more information, please write Department HC-11, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

CHECK THESE SUPERIOR FEATURES OF HYCAR

1. EXTREME OIL RESISTANCE — insuring dimensional stability of parts.
2. HIGH TEMPERATURE RESISTANCE—up to 250° F. dry heat; up to 300° F. hot oil.
3. ABRASION RESISTANCE—50% greater than natural rubber.
4. MINIMUM COLD FLOW—even at elevated temperatures.
5. LOW TEMPERATURE FLEXIBILITY—down to —65° F.
6. LIGHT WEIGHT—15% to 25% lighter than many other synthetic rubbers.
7. AGE RESISTANCE—exceptionally resistant to checking or cracking from oxidation.
8. HARDNESS RANGE—compounds can be varied from extremely soft to bone hard.
9. NON-ADHERENT TO METAL—compounds will not adhere to metals even after prolonged contact under pressure. (Metal adhesions can be readily obtained when desired.)

Hycar

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LARGEST PRIVATELY PRODUCED BUTADIENE TYPE

American Rubber

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

This advertisement appeared in a long list of carefully selected business papers TO HELP YOU SELL parts made from HYCAR.

AND HOW!...Philblack A gives your products . . .

- **GOOD ABRASION RESISTANCE!**
- **HIGH HOT TENSILE!**
- **LOW HEAT BUILD UP!**

Triple qualities that pay off in greater sales appeal and better finished product performance.
If you want more information, just write—

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Philblack Division

EVANS SAVINGS AND LOAN BUILDING · AKRON 8, OHIO

AMINOX
(POWDER)

a general purpose **ANTIOXIDANT** for natural rubber products, inner tubes, tire carcass, footwear, heels, soles, proofing, wire insulation and sundries. For natural rubber inner tubes use 1.5 parts to

- PROTECT AGAINST OXIDATION
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AMINOX is effective also in

GR-S · GR-M · NEOPRENE · GR-A

PROCESS · ACCELERATE · PROTECT
with
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NAUGATUCK CHEMICALS
Division of United States Rubber Company
ROCKEFELLER CENTER NEW YORK 20, N. Y.

IN CANADA: NAUGATUCK CHEMICALS DIVISION
DOMINION RUBBER COMPANY, LTD., ELMIRA, ONTARIO

RUBBER INDUSTRY

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UNION PACIFIC

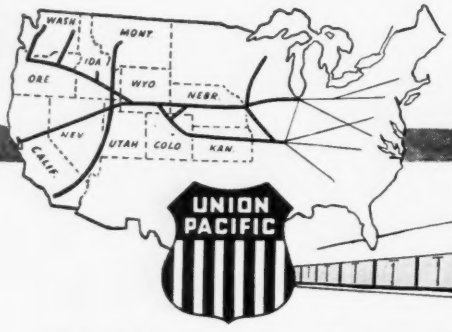
Your industry is one of hundreds served by Union Pacific. Every shipper is assured of efficient, dependable transportation when materials or merchandise are earmarked for the Strategic Middle Route, uniting the East with the Midwest, Intermountain, and Pacific Coast States.

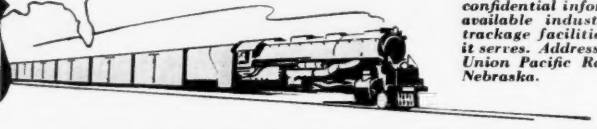
Union Pacific provides specifically designed cars, various services and departments, to assure proper handling of a wide diversity of products.

Union Pacific's facilities and equipment are ready to meet the heaviest needs of commerce. Traffic experts are stationed from coast-to-coast. They will help you with that *next* shipment—and every shipment.

For dependable, fast freight service always . . .

be Specific –
say "Union Pacific"





★ *Union Pacific will gladly furnish confidential information regarding available industrial sites having trackage facilities in the territory it serves. Address Industrial Dept., Union Pacific Railroad, Omaha 2, Nebraska.*

UNION PACIFIC RAILROAD

The Strategic Middle Route

IN WIND, RAIN, SNOW OR HAIL • YOUR FREIGHT GETS THERE BY RAIL!

For technical data please write Dept. RA-11

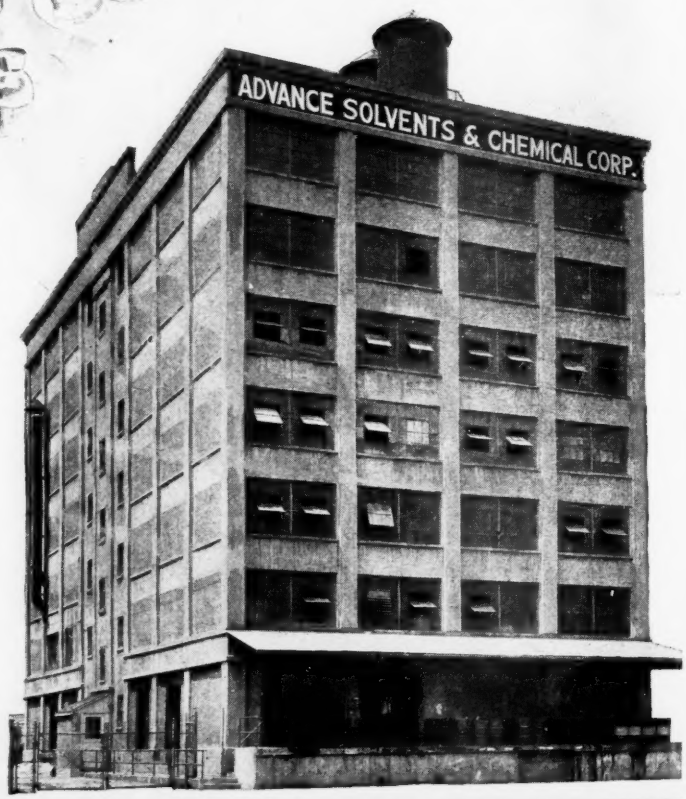
B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

ROSE BUILDING, CLEVELAND 15, OHIO

CHEMICAL MANUFACTURERS

Serving Progressive American Industries



Today Advance Solvents & Chemical Corporation, at its Jersey City, N. J. Plant, manufactures a wide variety of products designed to satisfy the exacting requirements of many of America's outstanding industries.

FOR THE PAINT AND VARNISH INDUSTRIES

Specialty Driers
Specialty Resins
Wetting Agents
Emulsifiers

FOR THE PLASTIC INDUSTRY

Cellulose Stabilizers
Vinyl Plasticizers
Vinyl Stabilizers

FOR THE RUBBER INDUSTRY

Dispersing Agents
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FOR THE TEXTILE INDUSTRY

Adhesive Resins
Wetting Agents
Softeners

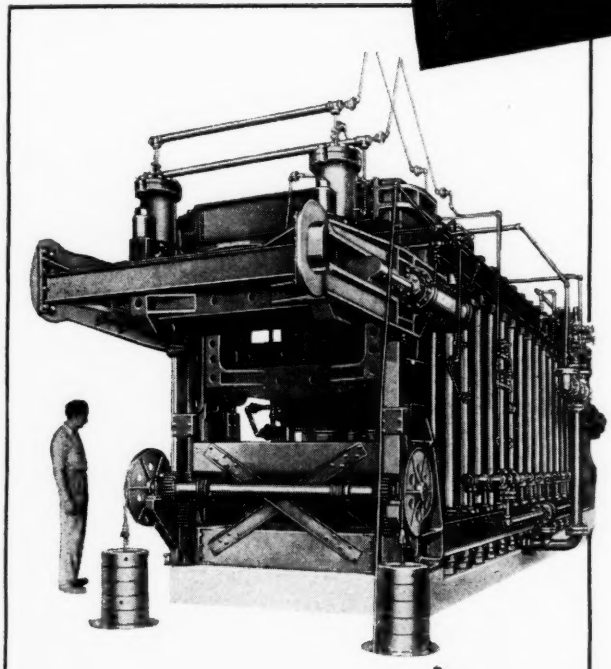
ADVANCE SOLVENTS & CHEMICAL CORP.
245 FIFTH AVENUE • NEW YORK 16, N. Y.

THIS NEW

IMPROVED

BELT CURING PRESS

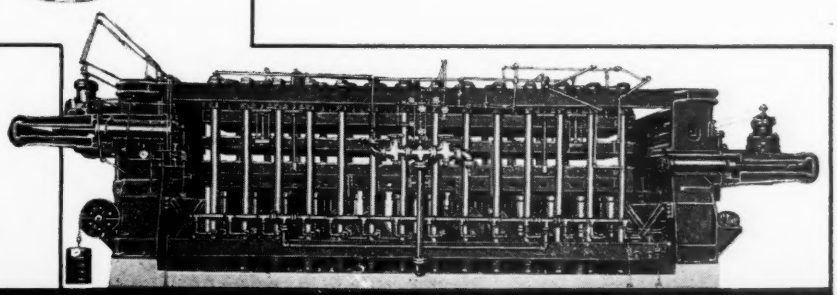
for CONVEYOR BELTING



This press has two openings permitting two lengths of belting up to 60 inches in width running in opposite directions, to be cured simultaneously. It is equipped with polished platens 63 inches wide by 31 feet long. Twenty-eight rams provide pressure during the curing operation. Proper belt tension is maintained by means of a clamp at one end and a stretcher at the other. These are mounted on separate stands rigidly braced by heavy compression members which extend the full length of the press. The clamp holds the belt while the stretcher is hydraulically pushed away from the press to give the belt the required stretch.

An exclusive Adamson United feature is the means of raising and lowering the stretcher clamps to maintain exact alignment of the press platen surface with the adjustment clamp surfaces. This mechanical method, much superior to hydraulic synchronization, causes the clamps and stretchers to move in perfect unison with the platen, eliminating entirely the possibility of the belt bending over the edges of the platen ends during the curing process.

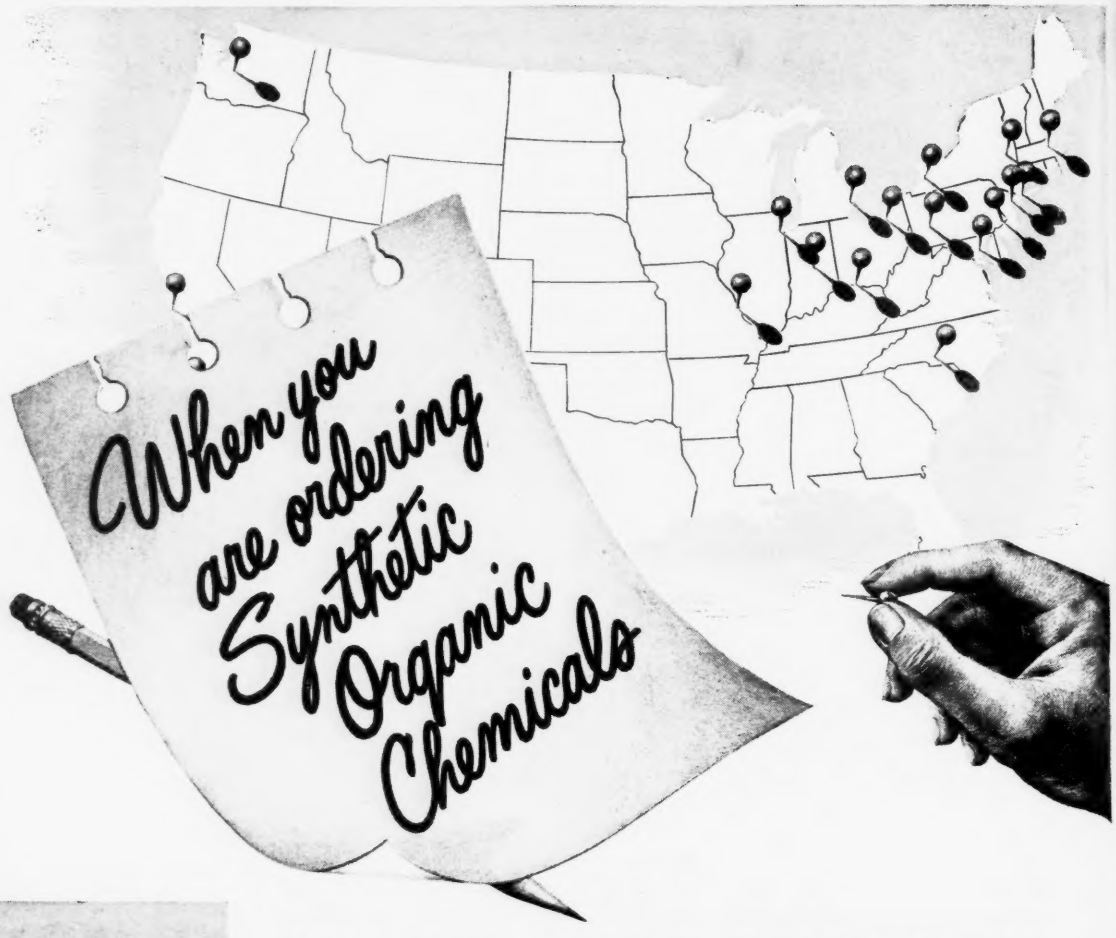
Designs and manufacturing capacity are immediately available for duplications of this or other types and sizes of Adamson United Belt Presses. Our engineers are prepared to create entirely new designs to meet specific operational or product requirements.



End and side views of ADAMSON UNITED BELT PRESS complete with stretchers, clamps, and steam and hydraulic piping with control valves.

ADAMSON UNITED COMPANY

AKRON, OHIO



Plasticizers

Resin Intermediates

Mold Lubricants

Solvents

Accelerator Intermediates

Emulsion Chemicals

CALL THE OFFICE NEAREST YOU

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Charlotte 2, N. C.	116½ South Church Street	Charlotte 4-4107
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Cincinnati 6, Ohio	920 East McMillan Street	AVon 4450
Cleveland 14, Ohio	1517 Superior Avenue	CHerry 5366
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San Francisco 4, Calif.	114 Sansome Street	DOuglas 1640
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St. Louis 8, Mo.	3615 Olive Street	FRanklin 6390

SYNTHETIC ORGANIC CHEMICALS

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York 17, N. Y.

LD

DIXIE 20
UNITED CARBON CO., INC.
CHARLESTON 27, W. VA.
NEW YORK • AKRON • CHICAGO

DIXIE 20

In SRF black there should be a perfect balancing of all the component properties contributing to rubber performance. UNITED with the "know-how" and engineering skill have achieved this perfect balance in DIXIE 20. With it you obtain ease and smoothness of processing, the proper degree of semi-reinforcement, low heat generation, maximum resiliency, best aging and non-staining. The wise compounder insists on DIXIE 20.

RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

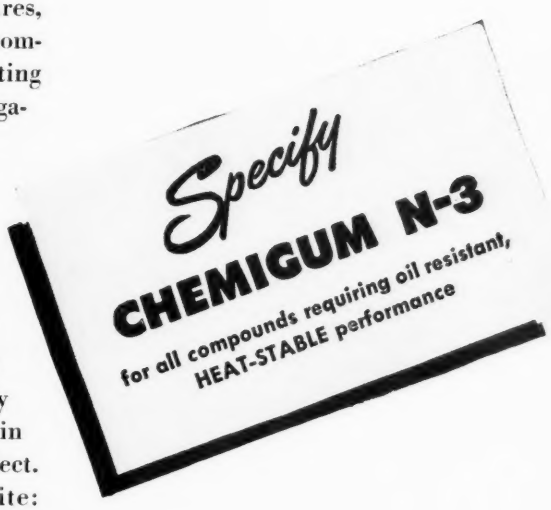
Charleston 27, West Virginia

For Better Molded and Extruded Goods use

YOU'LL find this thermoplastic reinforcing material a valuable processing aid for smooth extrusions and molded products. Easier to handle than carbon black, **PLIOLITE S-2** embodies a number of worth-while advantages.

It acts as a plasticizer at processing temperatures, assuring more uniform, more easily handled compounds. It positively reinforces stocks, imparting additional hardness with little loss in elongation. Excellent abrasion resistance and good flex-life.

PLIOLITE S-2 is particularly useful in all compounds requiring a light color, low gravity stock of 70-90 durometer hardness, with good processing characteristics and moldability. It is effective in GRS, Butyl, Neoprene and Buna-N compounds. Available now in quantity —either as a powder for your own mixing, or in master batches in whatever synthetic you select. For complete information and sample, write: Goodyear Chemical Products Division, Plastics and Coatings Dept., Akron 16, Ohio.



Pliolite, Chemigum—T.M.'s The Goodyear Tire & Rubber Company

GOODYEAR

THE GREATEST NAME IN RUBBER

Thinking about Hydraulic Presses?

Here are ways that Baldwin can help you

FIELD APPLICATION SERVICE

When you're thinking about the jobs you want presses to do . . . your production men may get some helpful tips from a Baldwin engineer. Long contact with the field, plus Baldwin participation in research projects, equip these representatives to discuss your problems from *your* viewpoint, and cooperate in finding the exact answer to your individual need.

STANDARD PRESS LINE WITH "CUSTOM-BUILT" FEATURES

When you're thinking about the presses for the jobs you want done . . . you'll find a line of modern Baldwin presses waiting to serve you. These presses include many of the "custom-built" features, developed through years of individual press design, that you ordinarily find only in special units. They are made available on standard models through efficient production methods in the Baldwin shops.

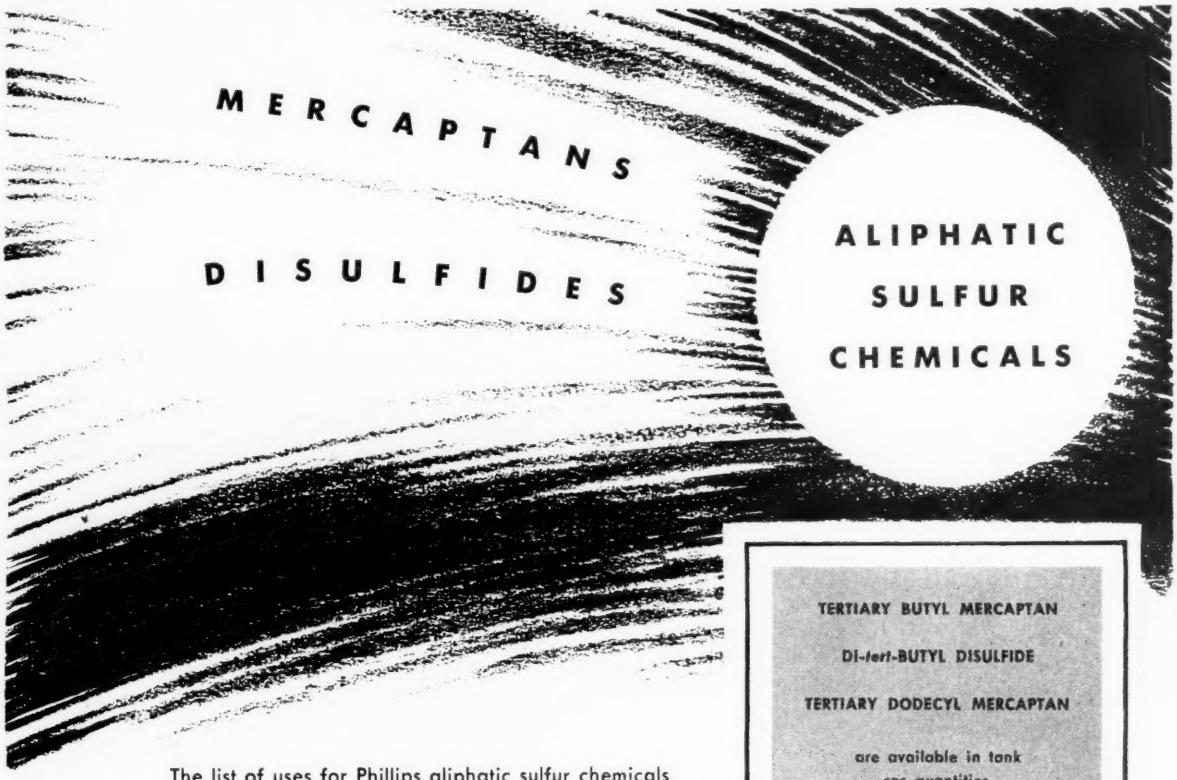
DESIGNS BASED ON LONG EXPERIENCE

Baldwin press designs are based on the accumulated experience of half a century devoted to designing and building hydraulic machinery. They reflect the engineering skill gained in meeting many problems in this field. We will welcome an opportunity to work with you. The Baldwin Locomotive Works, Philadelphia 42, Pa., U. S. A. Offices: Philadelphia, Chicago, St. Louis, Washington, New York, Boston, San Francisco, Birmingham, Houston, Cleveland, Detroit, Pittsburgh, Norfolk.

BLW THE BALDWIN GROUP **BALDWIN**

HYDRAULIC PRESSES

A NEW CONSTELLATION IN THE FIRMAMENT OF CHEMICALS



The list of uses for Phillips aliphatic sulfur chemicals is long and still growing. This entirely new series of chemicals from petroleum offers interesting possibilities in experimental and industrial processes. Phillips engineers would like to discuss with you their advantages in relation to your finished product.

SUGGESTED USES

Additives for oils . . . Odorants for gas . . . Polymerization modifiers . . . Intermediates for chemicals . . . Pharmaceuticals . . . Insecticides and fungicides . . . In dyestuffs and intermediates . . . In adhesives . . . Additives in rubber and plastics; alcohol denaturants; pickling inhibitors; lubricating oils.

TERTIARY BUTYL MERCAPTAN

DI-*tert*-BUTYL DISULFIDE

TERTIARY DODECYL MERCAPTAN

are available in tank car quantities.

The following are available in experimental quantities:

- Tertiary Amyl Mercaptan
- Tertiary Hexyl Mercaptan
- Tertiary Heptyl Mercaptan
- Tertiary Octyl Mercaptan
- Tertiary Tetradecyl Mercaptan
- Tertiary Hexadecyl Mercaptan
- Di-*tert*-Amyl Disulfide
- Di-*tert*-Hexyl Disulfide
- Di-*tert*-Octyl Disulfide
- Di-*tert*-Dodecyl Disulfide
- Di-*tert*-Butyl Polysulfide

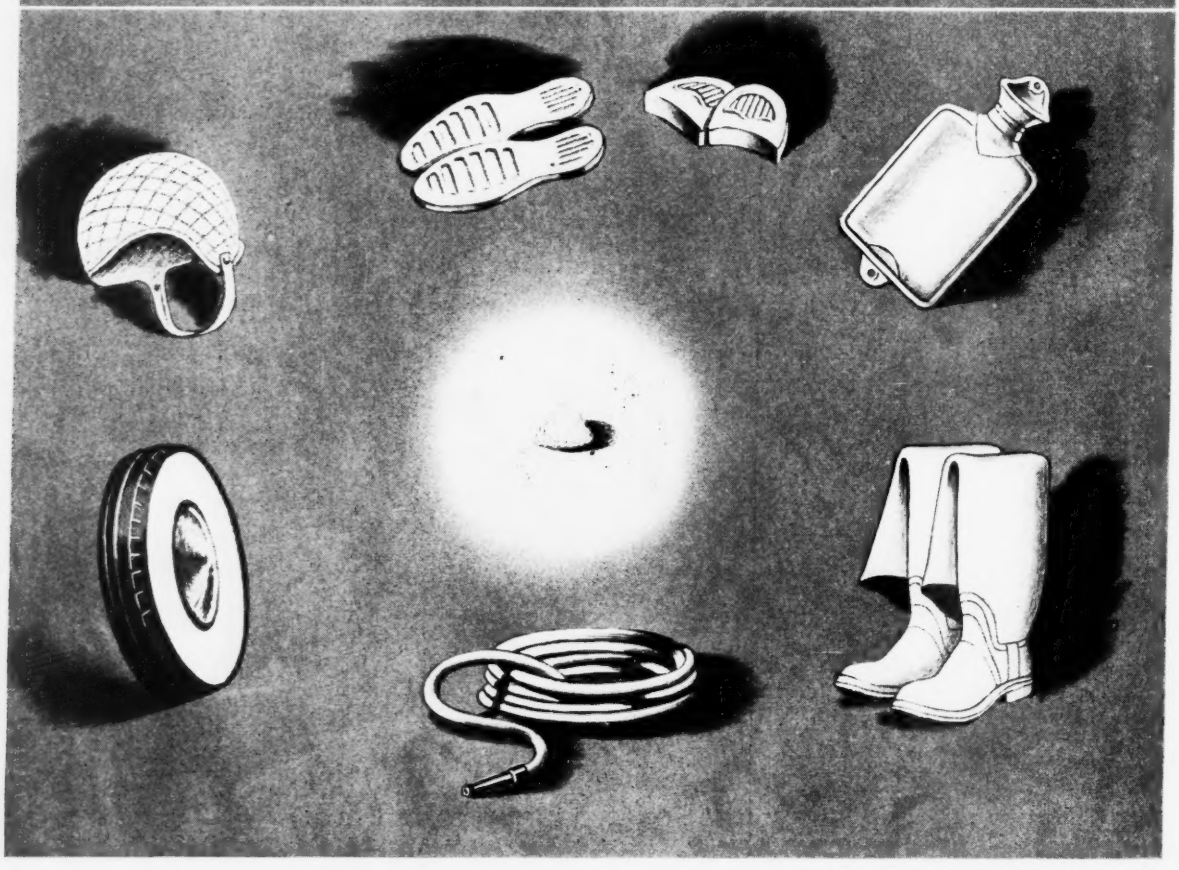
Phillips CHEMICALS

PHILLIPS PETROLEUM COMPANY

Chemical Products Department

BARTLESVILLE, OKLAHOMA

TITANOX . . . *the brightest name in titanium pigments*



a little TITANOX does a lot of WHITENING!

The whitening and brightening effect of TITANOX pigments makes possible the highest degree of whiteness obtainable in rubber stock. Furthermore, because of the high tinting strength of TITANOX, any desirable degree of whiteness can be attained with a proportionate minimum of pigmentation.

Different grades of TITANOX have been developed to give rubber varying degrees of tensile strength, elongation, flexing, tear and abrasion resistance, as well as dielectric qualities.

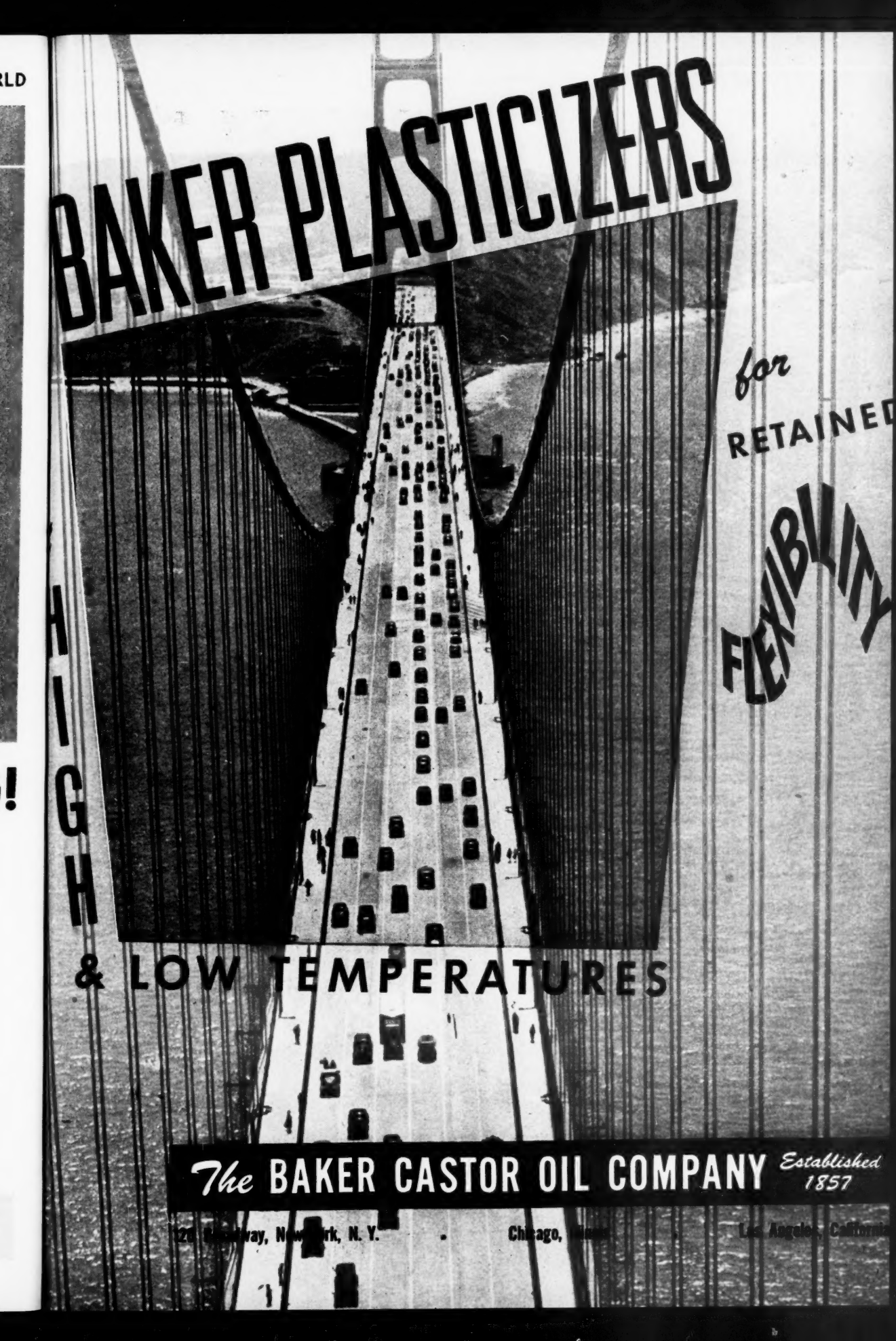
To tinted stocks, TITANOX pigments impart clarity of color and tone.

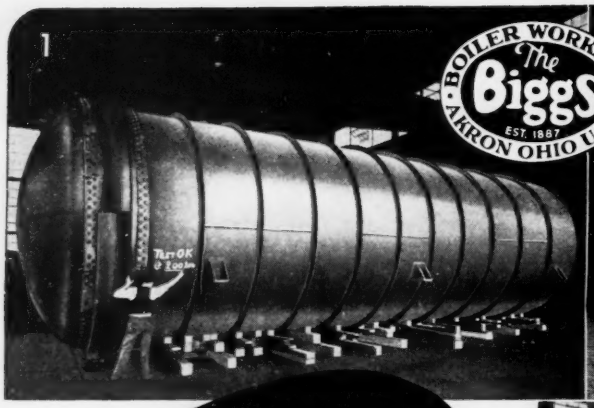
At present, there isn't enough TITANOX to go around. The producers are doing everything possible to increase the supply of these famous pigments to meet the needs of all.

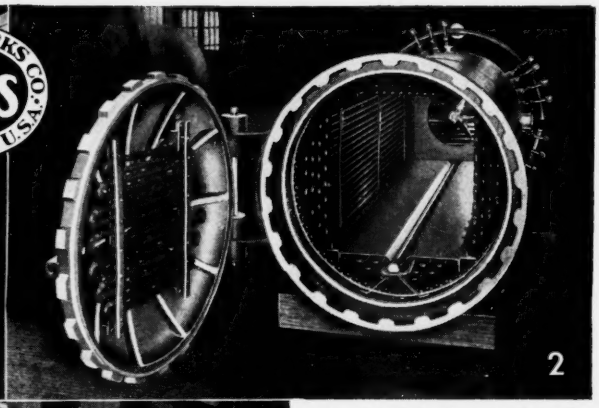
TITANOX
TRADE MARK

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT

111 Broadway, New York 6, N. Y.
104 So. Michigan Ave., Chicago 3, Ill.
350 Townsend St., San Francisco 7, Cal.
2472 Enterprise St., Los Angeles 21, Cal.


BAKER PLASTICIZERS
for
RETAINED
FLEXIBILITY
HIGH
& LOW TEMPERATURES
The BAKER CASTOR OIL COMPANY
Established
1857
Chicago,
Los Angeles, California





Biggs

VULCANIZERS and DEVULCANIZERS Have Served the Rubber Industry for More Than 45 Years

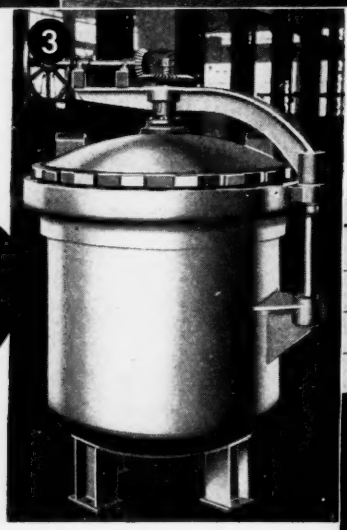


Fig. 1—15-ft. diameter by 45-ft. long horizontal vulcanizer with quick-opening door for vulcanizing rubber linings in large storage tanks. *Fig. 2*—Biggs vulcanizer with special heating manifolds and circulating fan; all sizes, various working pressures.

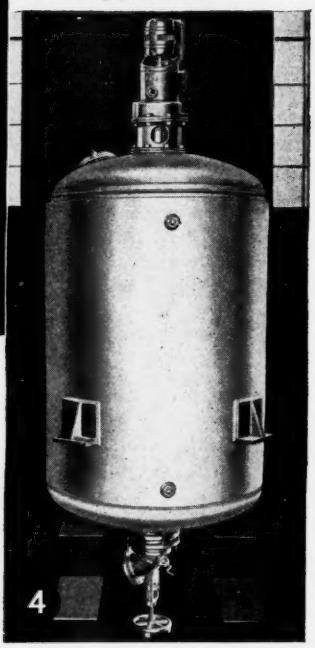
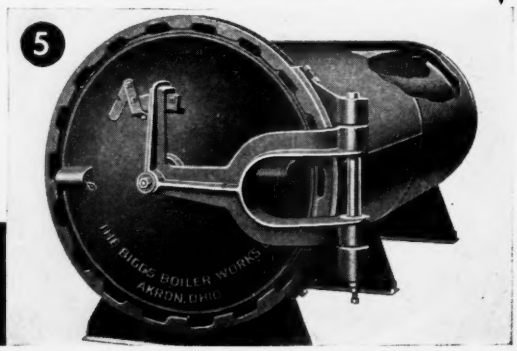


Fig. 3—vertical vulcanizer with quick-opening door. Door is handled by self-contained arm and gear-operating mechanism. Hand or motor operation.

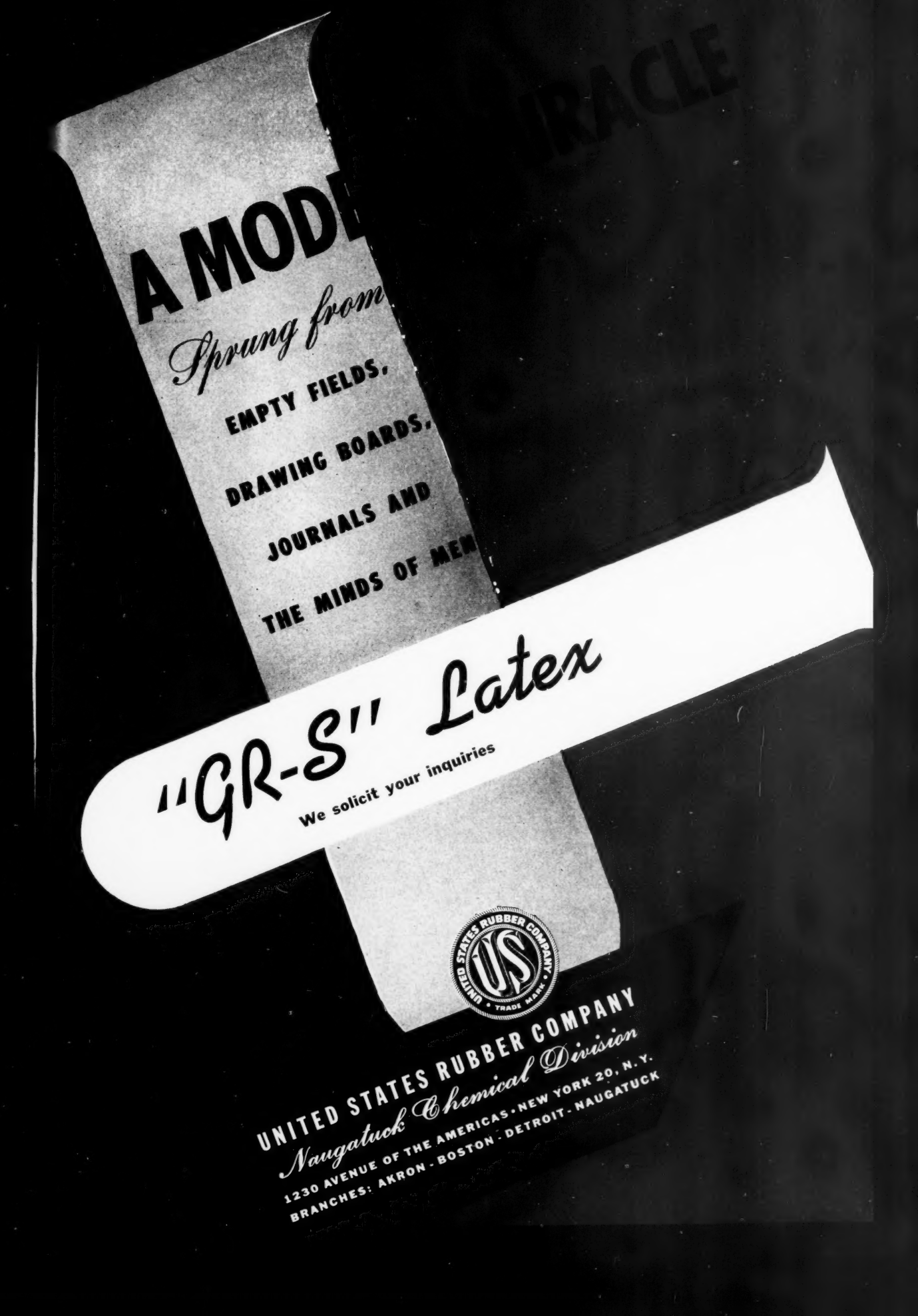
Fig. 4—high pressure heavy duty jacketed vertical devulcanizer with special agitator. Furnished in various sizes.

Fig. 5—horizontal steam-jacketed vulcanizer with hinge type quick-opening door; all sizes, for various working pressures. Welded construction throughout.

BIGGS-built vulcanizers and devulcanizers have occupied a prominent place in the development of the rubber industry since its inception. For more than 45 years Biggs has furnished single-shell and jacketed vulcanizers both vertical and horizontal, as well as many different types of devulcanizers to meet various requirements of the reclaim experts. . . . It is a far cry from the old days of bolted doors and riveted construction to Biggs modern all-welded units with quick-opening doors. Biggs vulcanizers and devulcanizers are available in all sizes and for various working pressures — with numerous special features. *Write now for our Bulletin 45.*



THE Biggs BOILER WORKS CO.
1007 BANK STREET, AKRON 5, OHIO, U.S.A.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We solicit your inquiries
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1230 AVENUE OF THE AMERICAS • NEW YORK 20, N. Y.
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PELLETEX IN TRANSPORTATION

In the field of transportation the use of PELLETEX has enjoyed a steady growth. This acceptance is due to an ever-widening appreciation of the valuable properties of this leading semi-reinforcing furnace black and to the fact that quality improvement and development has always kept pace with transportation needs.

WHY *PELLETEX* IS PREFERRED	WHAT IT DOES
High Abrasion Resistance	Long Wear
Superior Resiliency	Easy Riding
Low Heat Build-up	Cool Running
Low Permanent Set	Good Shock Absorption
Superior Aging	Long Wear
Oil and Solvent Resistance	Long Wear

Whether or not your rubber or synthetic products are used in transportation you will always find PELLETEX in tune with the times and our technical staff at your service.

MANUFACTURER
GENERAL ATLAS CARBON CO.
PAMPA, TEXAS
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NEW YORK, N. Y.
AKRON, OHIO

Get these properties in your Vinyl Compounds

1. Permanent Plasticity
2. Flexibility at Low Temperatures
3. Stability at High Temperatures
4. Non-Extractability by oils, fats, waters, and aliphatic hydrocarbons
5. Non-Migratability
6. Freedom from Odor and Taste
7. Resistance to Weathering

—plasticize with PARAPLEX G-25

Where service requirements for vinyl compounds are toughest, you'll want the outstanding permanence, non-migratability and ultraviolet resistance of Paraplex G-25. Coated fabrics, upholstery, simulated leather, luggage and free films are but a few of the many uses for this unique resinous plasticizer.

For use with vinyl latices, Emulsion G-25, a water dispersion of Paraplex G-25, displays the same properties as Paraplex G-25.

Let our technical staff show you how you can use these unique resinous materials to advantage.

PARAPLEX *is a trademark, Reg. U. S. Pat. Off.*

THE RUBBER CHEMICALS DEPARTMENT

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Every plant owning Scott Testers should provide their Maintenance Man with a Complete Set of these Data Sheets . . free upon request.

MAINTENANCE DATA SHEET NO. 7

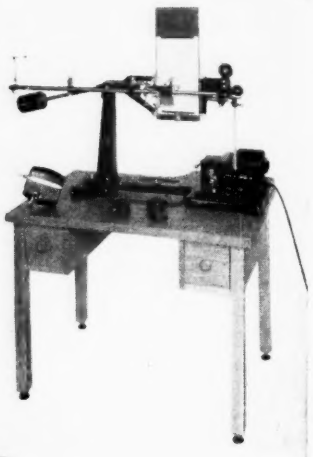
RECORDER (cont.)

To further test for error, locate a chart correctly in the platen as previously described. Return the clamps to starting position and fix both firmly to a non-extensible member, as a strip of steel. As load is applied, the pen line should parallel the chart axis indicating variable load and zero elongation. Non-parallelism indicates a variable error in elongation due to improper geometry of the tester or incorrect angle in printing the charts. It may also be due to a bent pen slide bar; or use of the wrong chart as elaborated below.

Possible causes of failure to record elongation properly. a. The ruling of the chart is not at the proper angle for this recorder. Some require lines at right angles; others have the elongation lines at less than 90° angle to the load line. For Model J, elongation lines are frequently curved, and will not record correctly on a tester requiring a chart with straight elongation lines. Some recorders magnify the elongation line, notably Models J, J-5, Q and X-3, and record incorrectly on charts not printed for the proper magnification. b. Where chart is held in guides, errors may be traced to faulty cutting of the chart, which should be a perfect rectangle, with edges cut exactly at the line printed as a guide. c. Errors can be due to failure of platen, pen and clamp to start moving at the same time, usually caused by excessive wear in the sliding mechanism.

If error still persists after the above procedure, it may be advisable to return the tester to the factory for correction.

IP-2 INCLINE-PLANE *SCOTT TESTER



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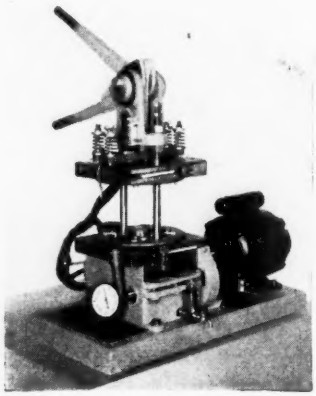
The exclusive "Incline-plane" Scott Tester is expressly designed for testing rubber thread for tensile and hysteresis. Equipped for various capacities from 0 to 2,000 grams, it performs the desired tests automatically, producing a literal stress-strain chart of utmost convenience for ready reading and reference filing.



MOONEY SHEARING-DISC *VIS-COMETER

*Patented

Illustrated is Model NBS of the Mooney Viscometer, of which Scott Testers, Inc., are Sole Licensees. This machine provides consistent and reproducible test values. (Older models may be readily revised and rebuilt to NBS specifications.)

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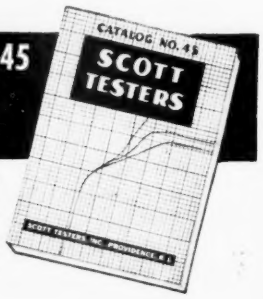

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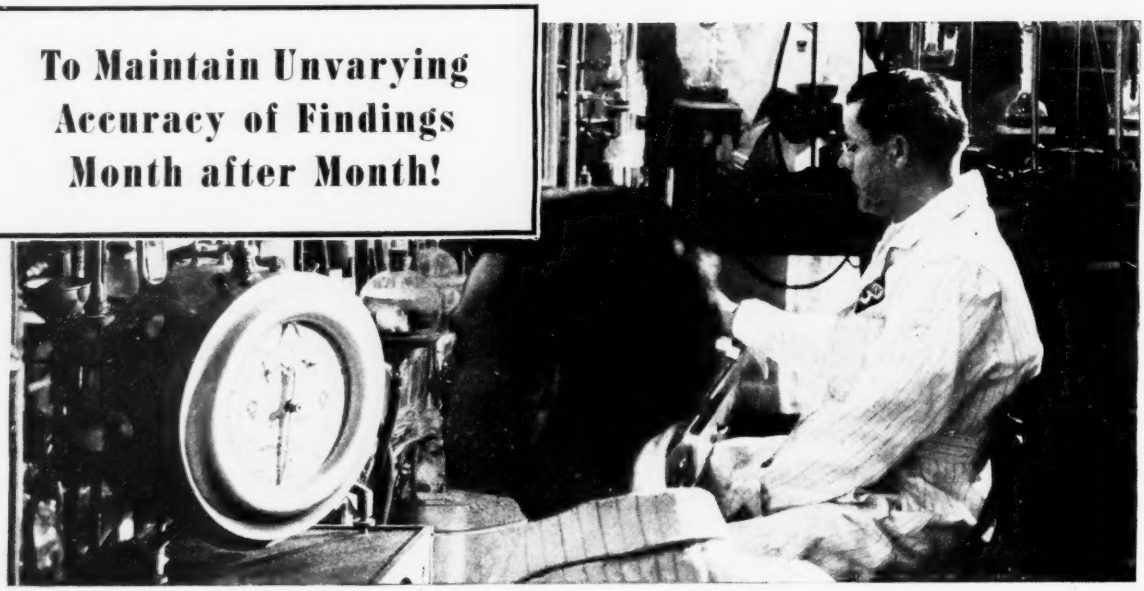

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Chemists making tests requiring the use of petroleum ether face this peculiar problem—petroleum ethers and other petroleum naphthas of the same boiling range probably will vary in chemical composition if obtained from different sources.

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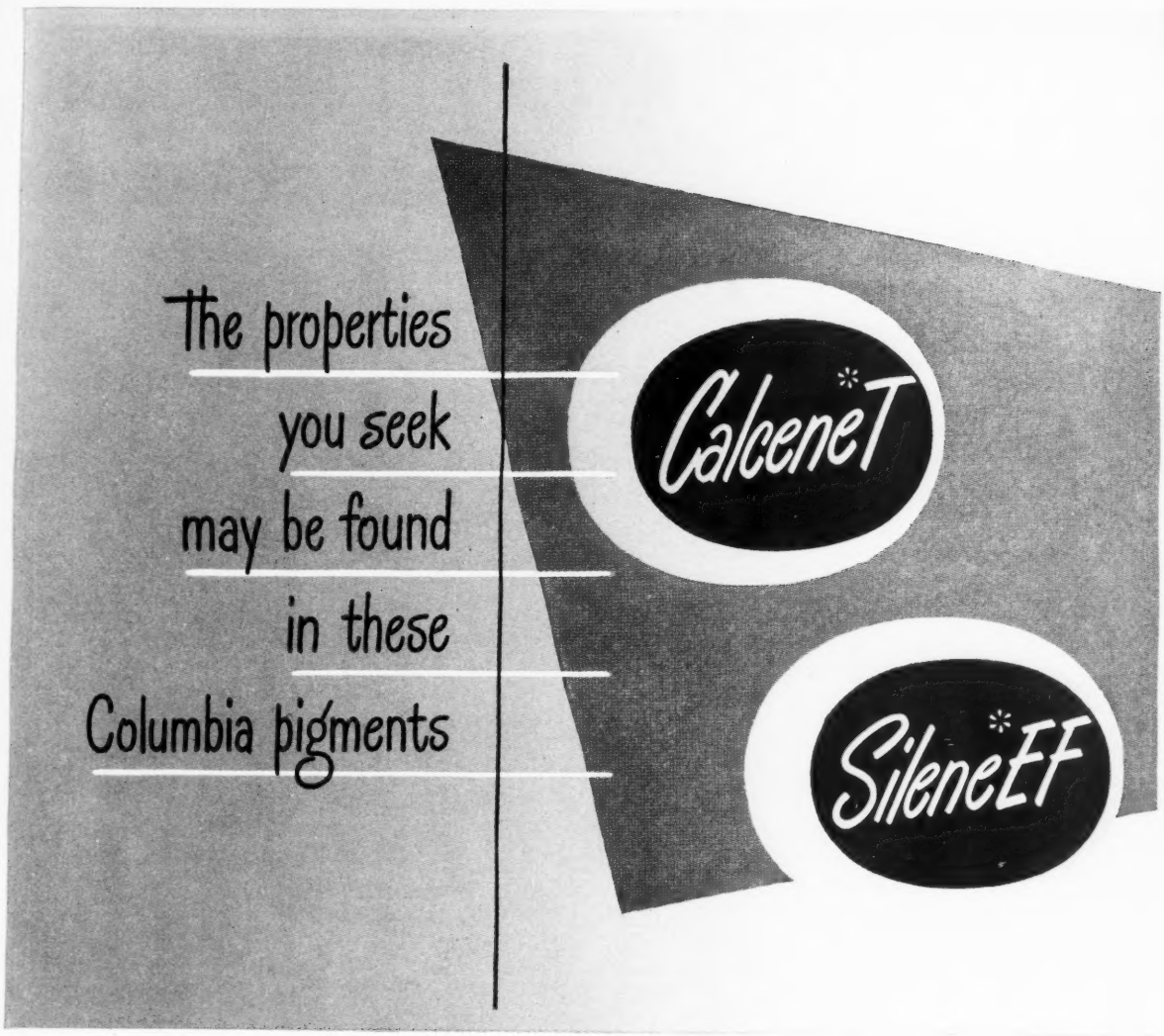

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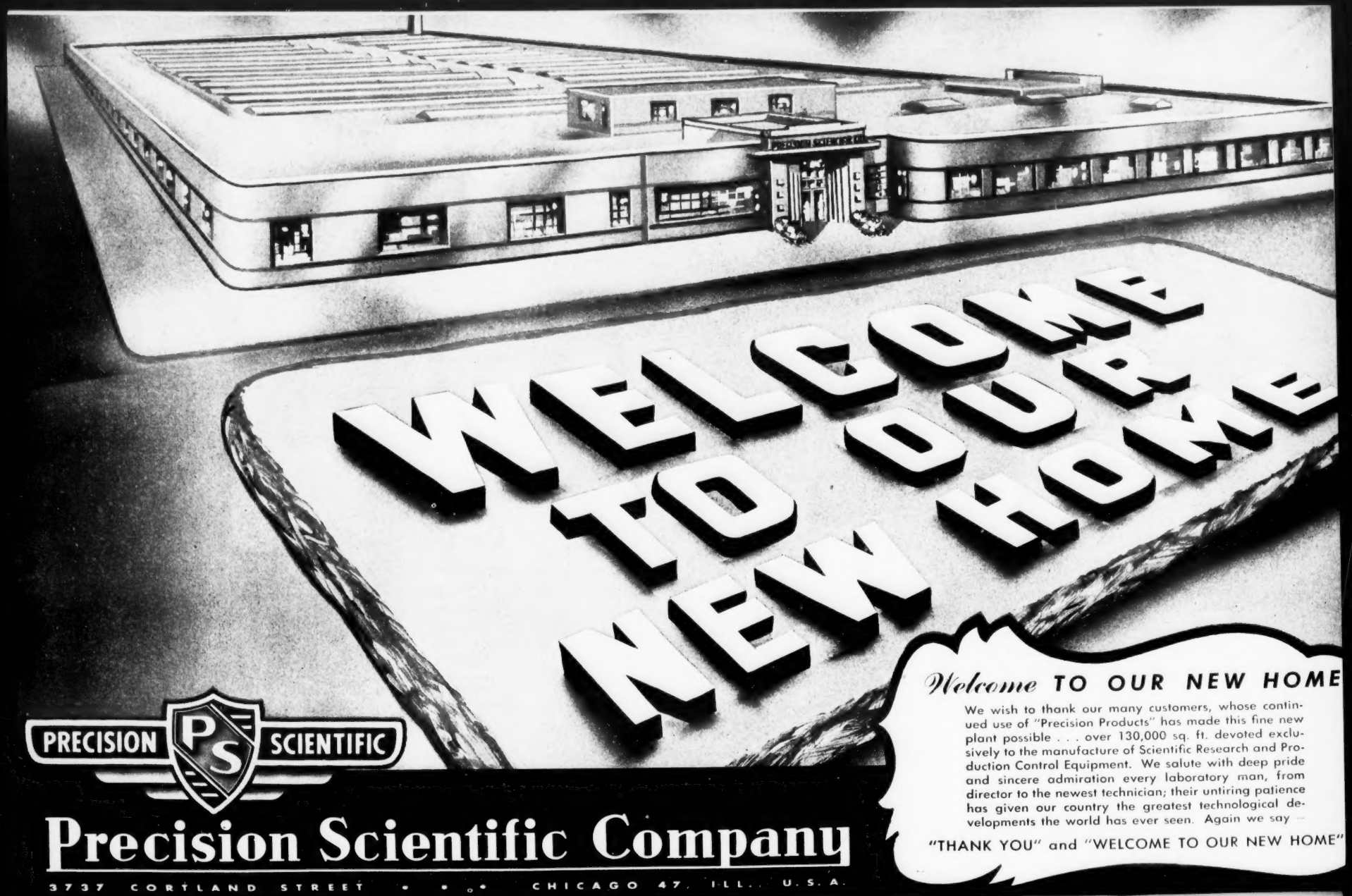

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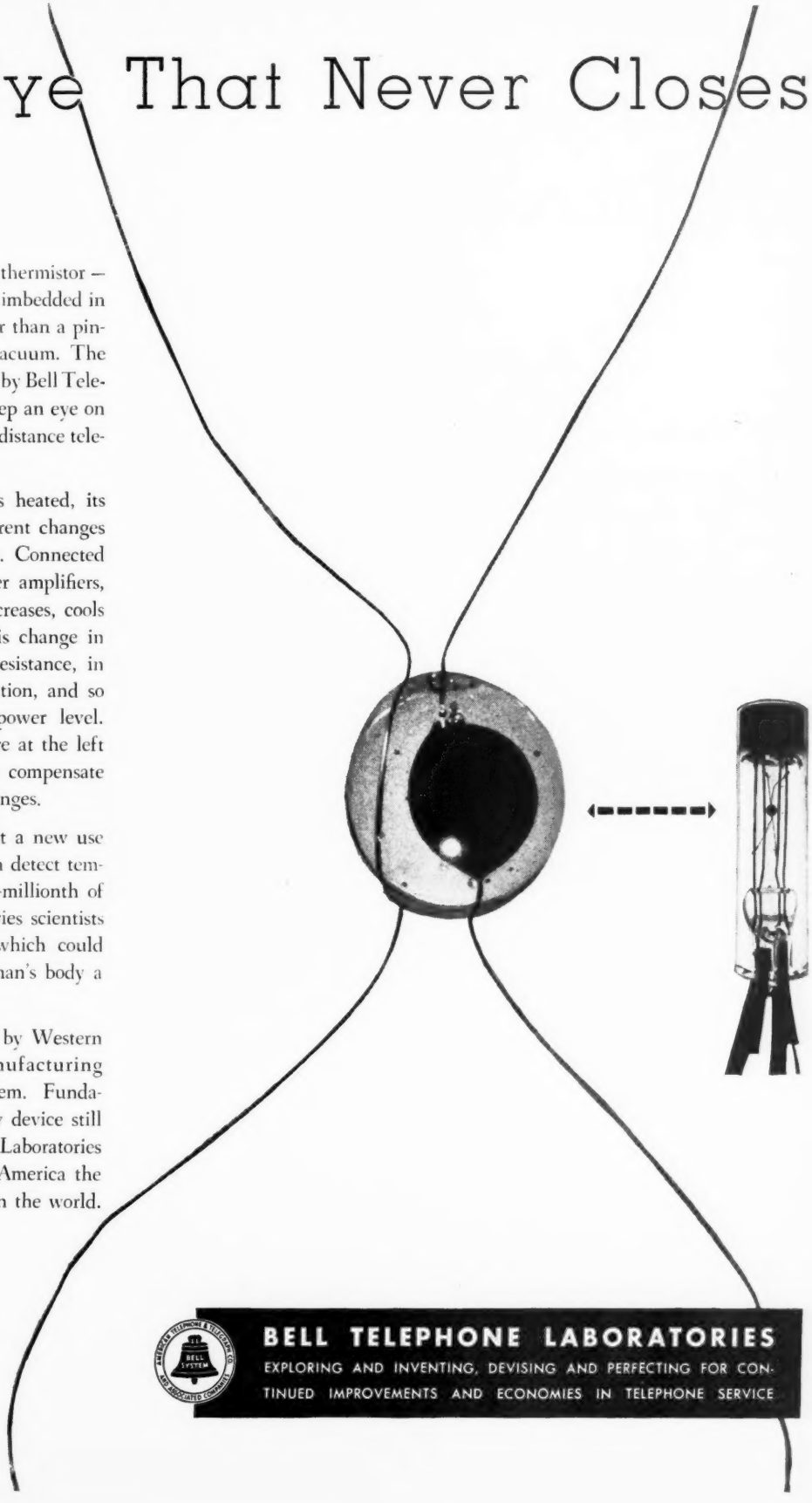
The Eye That Never Closes

You are looking at a thermistor — a speck of metallic oxide imbedded in a glass bead hardly larger than a pinhead and mounted in a vacuum. The thermistor was developed by Bell Telephone Laboratories to keep an eye on the amplification in long-distance telephone circuits.

When a thermistor is heated, its resistance to electric current changes rapidly. That is its secret. Connected in the output of repeater amplifiers, it heats up as power increases, cools as power decreases. This change in temperature alters the resistance, in turn alters the amplification, and so maintains the desired power level. Current through the wire at the left provides a little heat to compensate for local temperature changes.

Wartime need brought a new use for this device which can detect temperature changes of one-millionth of a degree. Bell Laboratories scientists produced a thermistor which could "see" the warmth of a man's body a quarter of a mile away.

Thermistors are made by Western Electric Company, manufacturing branch of the Bell System. Fundamental work on this tiny device still continues as part of the Laboratories program to keep giving America the finest telephone service in the world.



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Sulfur	3.0
"Monex"	0.2
Coumarone-indene Resin	7.5
E.L.C. Magnesia	5.0
ZINC OXIDE	100.0

ORIGINAL RESULTS

Time of Cure Min. at 45 Lb.	Tensile Strength (psi)	Per Cent Elongation	Modulus Load (psi) for Elongation of: 200%	300%	400%	500%	Permanent Set	Shore Hardness	Tear Resistance Tested at: Room Temp.	100°C.
4	110	940	35	35	75	75	.38	22	27	9
7.5	1680	1020	115	190	230	305	.36	34	109	48
15	1870	810	190	265	380	495	.36	40	84	53
30	1820	710	270	390	505	700	.33	43	90	47
45	2080	735	270	385	540	770	.35	45	75	52
60	1940	705	305	420	570	800	.32	45	76	51
90	2110	750	310	385	540	730	.32	45	79	47

Time of Cure Min. at 45 Lb.	Goodyear-Healey Pendulum: Indentation in mm.	Per Cent Rebound	Shore Hardness	Compression Fatigue (Goodrich Flexometer)*: Per Cent Initial Comp.	Running Time and Per Cent Permanent Set	Max. Temp. Rise °C.	Dynamic Compression: Initial	Final	Cut-Growth Resistance Tested at 70° C. Inches Failure: 1,000 Cyc.	8,000 Cyc.
60	8.02	47.0	42	25.1	15'-5.4	27.5	10.0	14.6	.07	.58

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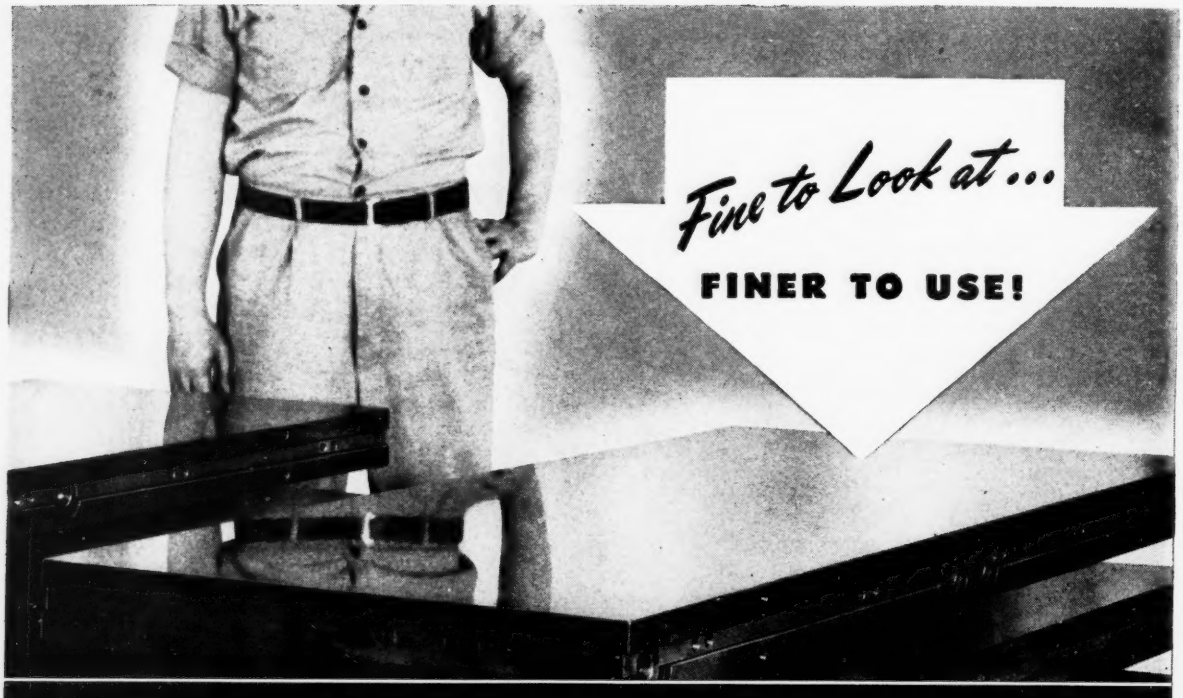

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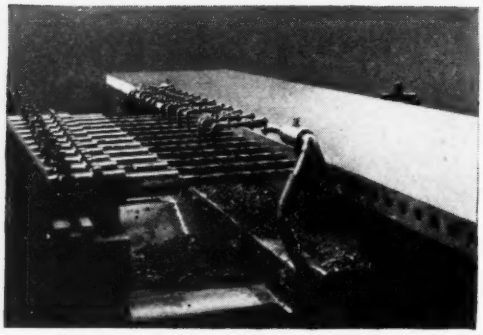

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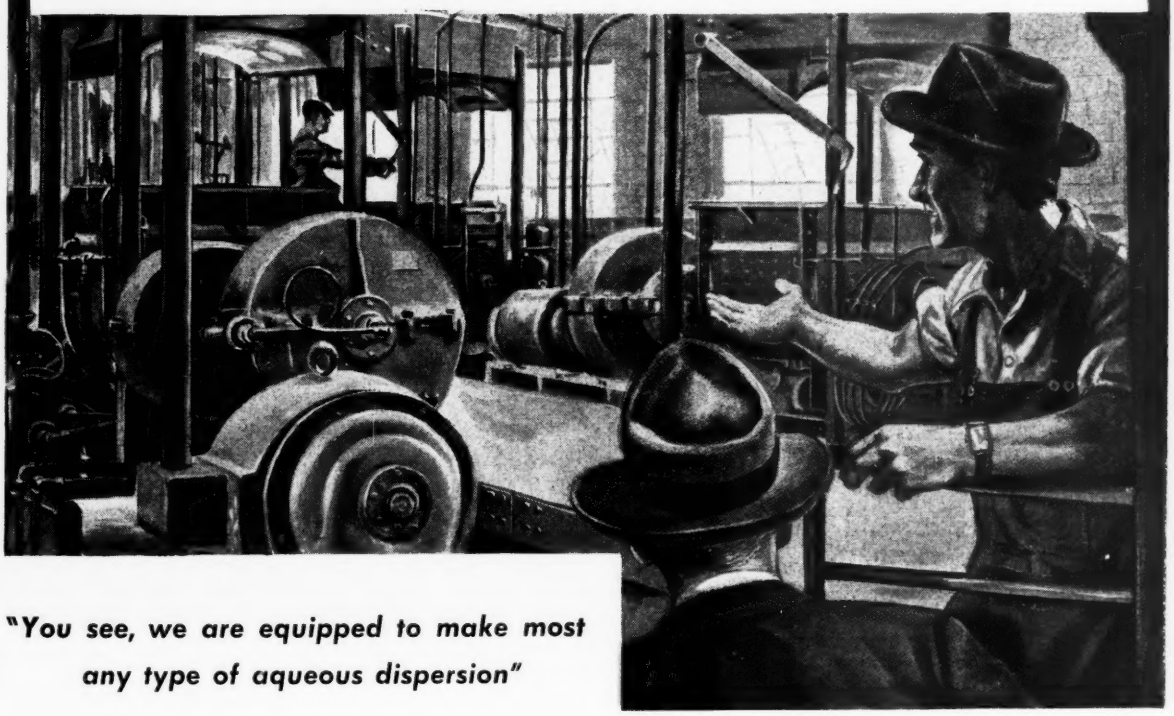

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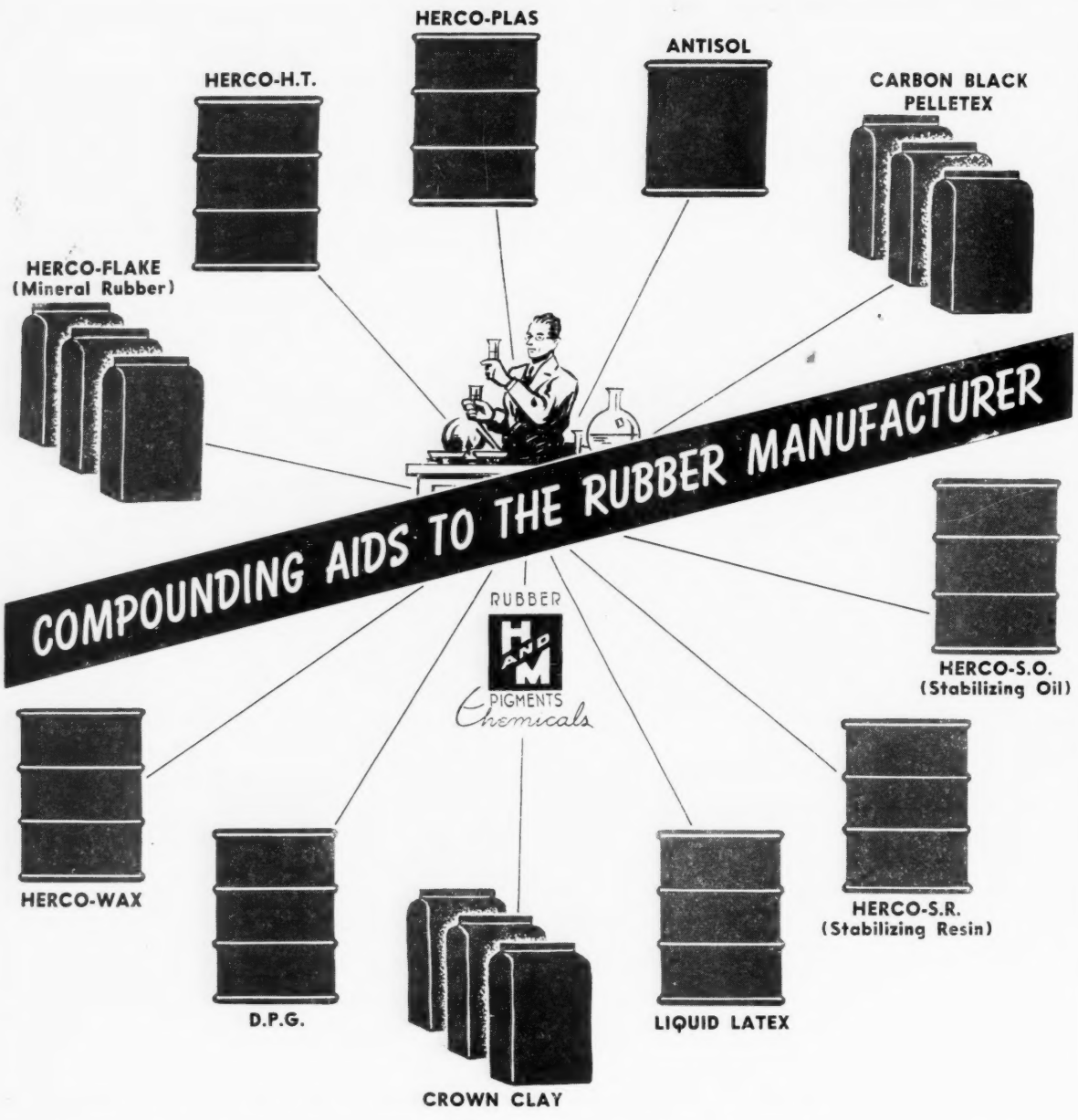

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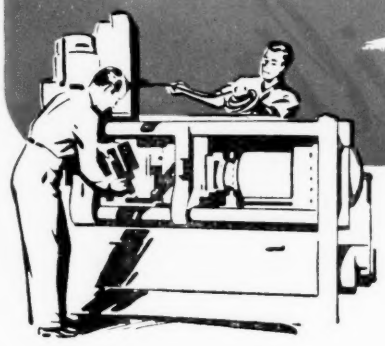

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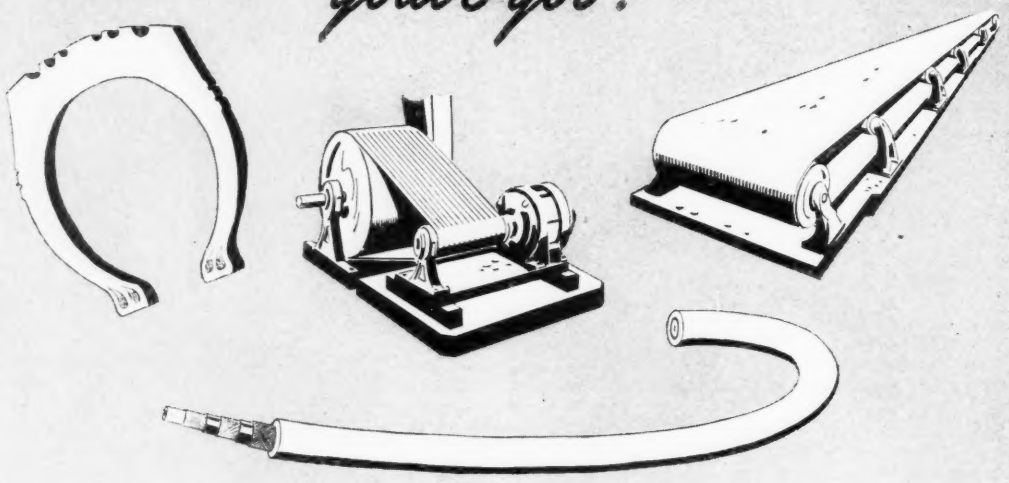

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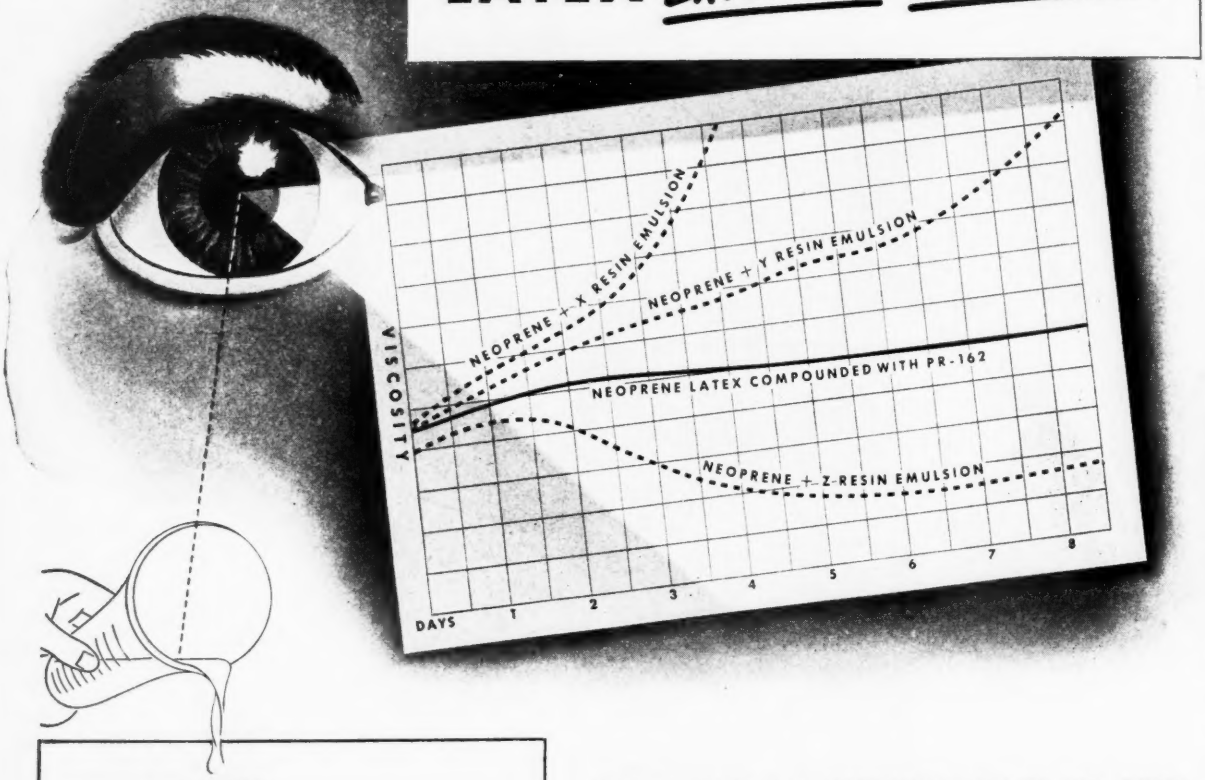

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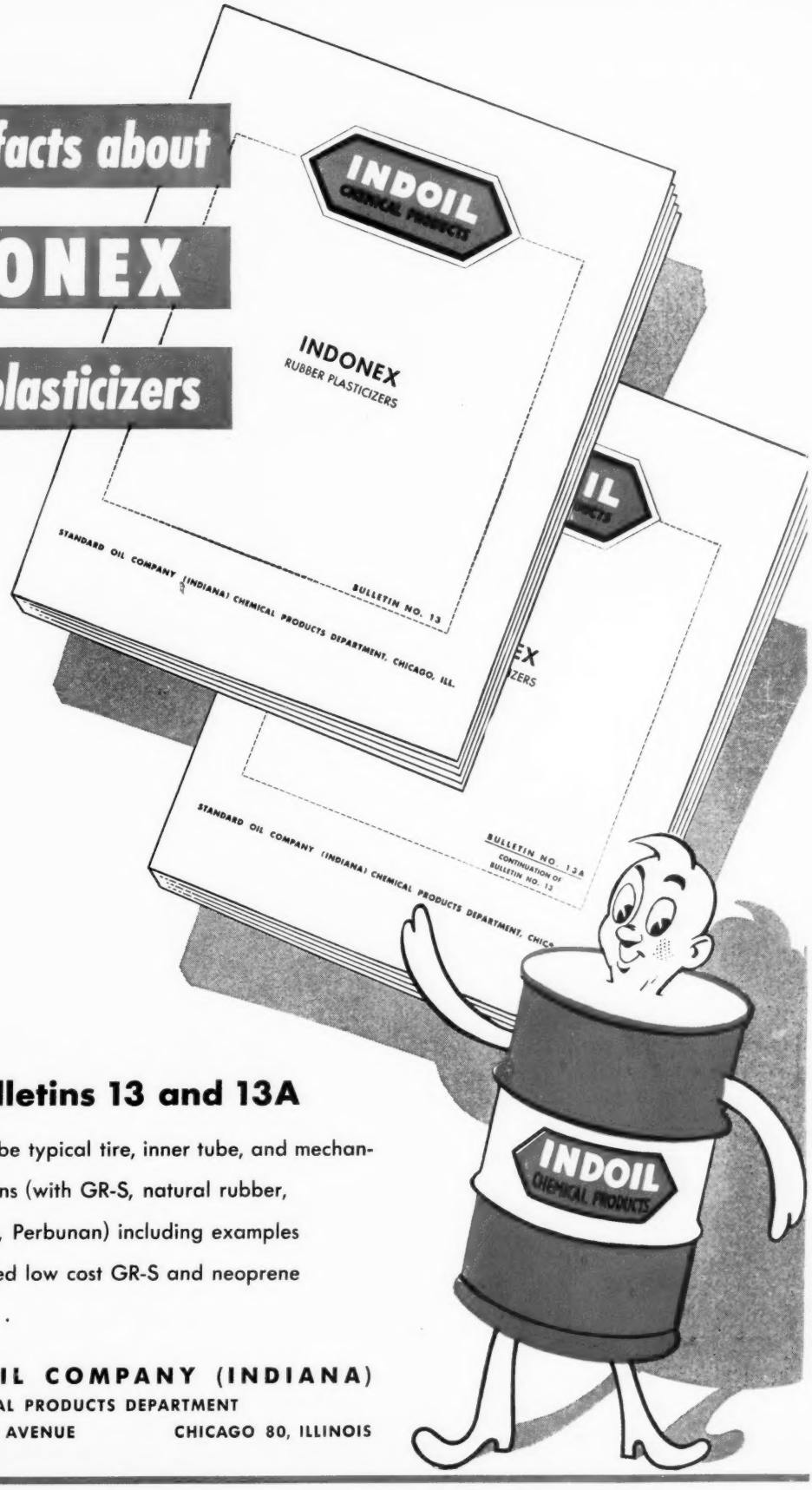

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Volume 115 Number 2

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ARTICLES

Far East Rubber Output: Progress and Prospects — EVERETT G. HOLT 205

Centrifuging of Latex — G. J. VAN DER BIE 209

A Simple Cold Test for Vulcanized Polymers — HAROLD M. LEEPER 215

Recent Russian Literature on Natural and Synthetic Rubber—XXIV — M. HOSEH 216

Hysteresis and Methods for Its Measurement in Rubber-Like Materials—II — J. H. DILLON and S. D. GEHMAN 217

Review of Plastic Materials Supply Outlook — F. H. CARMAN 228

DEPARTMENTS

	Pages
Editorials	223
Scientific and Technical Activities	224
Plastics Technology	228
News of the Month:	
United States	232
Canada	247
Obituary	248
Patents	249
Trade Marks	254
New Machines and Appliances	256
Goods and Specialties	262
Rubber Industry in Europe	265
Far East	270
Latin America	272
Book Reviews	273
New Publications	274
Bibliography	277
Trade Lists Available	282

MARKET REVIEWS

	Pages
Crude Rubber	254
Cotton and Fabrics	280
Reclaimed Rubber	282
Scrap Rubber	282
Compounding Ingredients	282

STATISTICS

Dominion of Canada, August, 1946	284
Rims Approved and Branded by The Tire & Rim Association, Inc.	240
Tire Production, Shipments, and Inventory	234
CLASSIFIED ADVERTISEMENTS	292
ADVERTISERS' INDEX	298

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RUBBER WORLD
NATURAL & SYNTHETIC

Volume 115 | New York, November, 1946 | Number 2

Far East Rubber Output: Progress and Prospects[1]

Everett G. Holt[2]

The Author

DURING this past summer the writer made an investigation of conditions affecting rubber production in the countries that were freed from Japanese occupation. Investigations covered British Malaya, the Netherlands Indies, British Borneo (Sarawak, North Borneo, Brunei, and Labuan), Indo-China, and Siam. Ceylon was not visited, but will be included in some of the estimates made below, since the facts concerning Ceylon are fairly well known.

The trip occupied the months of May, June, and July, and in its course covered approximately 25,000 miles by air and 1,600 miles by motor vehicles. The purpose was to estimate the near-future outlook for rubber production in the countries liberated from Japan. The trip was sponsored by the Department of Commerce and the Rubber Development Corp. and was supported by the War and Navy departments because of their interest in stockpiling natural rubber.

Continuing U. S. Interest

Just a word about prewar conditions. Before the United States had a large synthetic rubber industry, the American policy in rubber was to encourage diverse regions of production, for strategic reasons. It must not be implied that the policy has now changed, but obviously we are now less dependent on foreign sources for bulk supplies of rubber materials. Also, in prewar years we were opposed to the restriction of rubber production. Since the war ended, the possibility that overproduction of rubber might be undesirable is recognized, and the door has not been closed against consideration of measures to deal with such a situation if it should arise.

However the Interagency Policy Committee on Rubber has recommended that an important tonnage of domestically produced synthetic rubber be used annually in this country regardless of economic considerations and has indicated that product specifications and subsidies are the methods of assuring this result which are at present most favorably regarded, if the result is not achieved by voluntary industry action. Nevertheless the plan is to use a major tonnage of natural rubber as soon as supplies are amply available.

Native Output Means More Now

It is important to bear in mind the fundamental division of the Far Eastern rubber industry between two broad classes of producers—the large estates on the one hand, and the natives and small holders on the other hand. Before the war the estates were the only influential group; the natives were inarticulate. With a world capacity for production of approximately 1,650,000 tons in 1941 and an actual production of 1,500,000 tons that year, the estates produced about 55% of the Far Eastern output and the natives only 45%, although the natives then had more than 50% of the capacity.

While the potential capacity of the Far Eastern countries may now be greater than prewar, it is believed preferable for the present to estimate the practical capacity as unchanged. Considering the Far East as an entity, the estates in the aggregate have a production capacity near 800,000 tons a year, and the natives a capacity of 850,000 tons. In the current year 1946 the estates as a whole, according to my estimates, will produce at an average rate near 30% of capacity, the natives at over 40%. In 1947 the estates may produce nearly 50% and

[1] Reprinted from *Foreign Commerce Weekly*, Oct. 12, 1946, pp. 5-9. This paper was also presented before the Boston Rubber Group, Boston, Mass., Oct. 4, 1946.

[2] Rubber Adviser, Office of International Trade, United States Department of Commerce, Washington, D. C.

the natives and small holders near 70% on the average.

This calculation means that both in 1946 and in 1947 the natives will be producing more than 60% of the plantation rubber, compared with only 45% prewar. Because of political considerations it would seem that any measures more restrictive of production by natives than of production on estates would be less feasible than in prewar years.

The natives produce at lower cost than the estates, and the 20¼c fixed United States buying price effective during the first half of 1946 was definitely stimulative of native production. The large estates, however, were getting back in production as a matter of policy in many cases without regard to immediate profits during the first half-year of opening operations. The large estates in future seem likely to experience more severe competition than in prewar years from native producers of natural rubber. In this connection, a special three-month investigation of rubber small holders in Malaya was begun in July by a representative of the British Colonial Office, reflecting awareness by official sources in the United Kingdom of the increased importance of natives in the plantation rubber economy.

Production Estimates, '46, '47

Estimates of production in the various countries investigated—adding Ceylon but not India and Burma—have now been put together. In round figures, the estimates made for new production of rubber in these countries of the Far East add up to 600,000 tons in 1946 and 950,000 tons in 1947. Approximately 210,000 tons became available during the first half of 1946, leaving 390,000 tons to be produced during the last half. To any thinking person it will be obvious that the start in production made at the time of the writer's visit was insufficient to support fully the estimates, but now we have further information covering July and August, and these added data make the estimate for 1946 appear at least trustworthy if not conservative.

Factors Hampering Production

Speaking of the large estates as an entity again: the production bottlenecks are two—political conditions being the hampering factor in Netherlands India, and lack of labor the chief retarding factor in Malaya and Indo-China. But neither political conditions nor labor is likely to constitute more than temporary barriers to large-scale native production. The natives' production is, however, affected by other factors, among which insufficiency of transport facilities in the Netherlands India and British Borneo is outstanding; while lack of trade goods is a general condition in all native rubber areas that makes not only for high prices, but reduces the *incentive* for rubber production.

In general, the natives have rapidly swung into production in all areas; while the progress made in estate production has been slower, though in British Malaya it is now well advanced and far ahead of that in any other country.

The United States could most assist rubber production in the Far East by making available ample supplies of cotton piece goods to stimulate native rubber production in the shortest possible time.

A brief review of conditions in each country will suffice to paint the general picture.

Siam's Potentialities

The Siamese rubber industry has a probable capacity of 60,000 tons annually. This has usually been accounted all native rubber, but actually about a third of the total is in small and large estates, the estates over 100 acres in size representing about a seventh of the capacity.

When the writer arrived there on May 13, the country had little production, and no licenses for export had been issued, although some 3,500 tons had been offered for export. When he again passed through Siam at the end of July, the rubber properties were producing about 30%, some 6,000 tons of rubber were on the way to the United States; and a total of 9,000 tons has now been bought by the Rubber Development Corp., all for shipment from Bankok by September 30. Also, some 2,500 tons of Siamese rubber was imported into Malaya up to the end of July—1,500 tons *in July alone*. The production in Siam is expected to be 20,000 tons in 1946 and double that amount in 1947. The principal bottlenecks are transportation—both rail and vessel—and lack of incentive goods. The Siamese are anxious to trade with the United States, and rubber can represent an important factor in future trade relations between the two countries as a means of dollar exchange and a support to steamboat connections.

French Resuming Operations

In Indo-China the industry is nearly all estate owned, and the ownership of the 330,000 acres is highly concentrated, fully 80% being in the hands of 30 large companies. The 170,000 metric tons of rubber accumulated in Indo-China at the end of the war had been reduced 22,000 tons by fires during the Annamite troubles, and, of the remaining 148,000 tons, more than 76,000 tons had been exported up to June 30. The capacity for production is estimated at 80,000 tons at present. Considerable new planting went on in the years 1942 to 1944, which will result in future higher capacity.

Labor scarcity and civil disturbances are the principal barriers to rubber production. At present it is impossible to recruit labor in Tonkin, the customary course. With available labor it is anticipated that the 1946 production will not exceed 20,000 tons, but efforts are being made to recruit Chinese labor from Canton, and, if this drive is successful, production in 1947 should reach 50,000 tons. Tapping has been gradually getting under way since the end of March. Several thousand hectares of rubber were badly damaged by fires during the February-March dry season.

Indo-China in prewar years contributed heavily to the rice supplies of Southeast Asia; in 1946 and 1947 the most optimistic forecasts indicate that its contribution will be much less than formerly.

France is a substantial consumer of rubber; the production of Indo-China and of French colonies in Africa in 1946 and 1947 is expected to be less than the consumption in France so that no net export of rubber from French Empire sources is expected after the accumulated stocks have been cleared.

British Borneo Slowed Up

In British Borneo (including North Borneo, Sarawak, Brunei, and Labuan) there is a capacity for more than 60,000 tons rubber production a year—preponderantly native rubber. North Borneo and Labuan ports suffered heavy bomb damage during the war, but in Sarawak, which is the most important rubber producing region in British Borneo, the damage in rubber ports was negligible. Labor is amply available, and production is now getting under way there rapidly, although during the first half of 1946 lack of transportation facilities resulted in very slow progress. The entire area is expected to produce about 25,000 tons in 1946 and 50,000 tons in 1947. At present all shipments go directly to British Malaya.

Malayan Progress Outstanding

British Malaya and Netherlands India are the two chief producing countries. In Malaya the capacity is judged to be 600,000 tons—335,000 tons on estates over 100 acres and 265,000 tons on smaller estates and native holdings.

There were troubled times in Malaya from August, 1945 (when the Japanese surrendered) to the end of 1945, and in that period many estates suffered severe damage to buildings and equipment, and looters took a severe toll of furniture, fixtures, and other valuables that could be moved. Since the start of 1946, however, conditions have steadily improved, and the economy had been restored to a surprising extent when the writer arrived there in late May. With four months' data available it is estimated that the production there this year will amount to 320,000 tons (145,000 from estates and 175,000 from small holdings); while for 1947 production should be from 450,000 to 500,000 tons.

The civil troubles in Malaya have been quelled without direct Army intervention, and, while there are still bands of armed men in Malaya, these have been reduced to the status of outlaws; and, with the death penalty for illegal possession of arms, these groups are being broken up.

The estates' staffs have tackled with fine spirit the tremendous problems of rehabilitation, and they made highly commendable headway, under most difficult conditions, during the first half of 1946. The stories of lack of food and of civil troubles have been somewhat overemphasized, but cost of living is high, food and trade goods are still scarce, and labor troubles are likely to be recurrent. There is no immediate prospect of solving the problem of shortage of estate labor—there has apparently been little progress in negotiations with the object of getting labor from India. It is possible that resort may be had to immigration from China, and at present such immigration is limited to 500 men and 500 women monthly, under a 1938 law.

In the program for rehabilitation of estates in Malaya the operations of practically all the European owned estates, comprising approximately two-thirds of the acreage on estates of more than 100 acres, have been under the jurisdiction of the Malayan Rubber Estate Owners Co. These estates have been organized in seven major groups. The objective of cooperative action was to assure equitable distribution of scarce materials, labor, European staff, and equipment in an orderly manner. Nevertheless, since competition is the essence of business, the major groups have been competitive to some extent, and one group in particular progressed far more rapidly than others. It is unlikely that the MREOC will continue to function generally after 1946, but it is possible, if not probable, that the importance of certain estate agency firms in future will be influenced by their performance under MREOC operation during this year, the more successful being likely to gain additional adherents.

In general, white staff on estates will be kept to a minimum in future; such personnel will probably have increased individual responsibilities and will require higher salaries as compared with prewar years; while intermediate supervisory functions will devolve mostly upon Asiatic staff.

The condition of workers on estates early this summer was already much improved over their condition at the end of 1945, and there is now no danger of starvation in Malaya, although rationing of cereals and rice in particular is and will continue to be severe for at least another year.

The overall picture for Malaya is that an active, alert business community is now prepared again to do business on a large scale "at the old stand," but with native rubber more significant than it was in prewar years.

Indies Leads in Capacity

Netherlands India, as we knew it prewar, had attained a larger capacity for production of rubber than any other country. Java was rated capable of producing nearly 125,000 tons of estate rubber annually; Borneo and the Eastern Islands had a capacity of 110,000 tons annually (nearly all native rubber). Sumatra and its satellite islands are, however, the keystone of both the estate and the native industry in the Indies and were capable, alone, of producing 175,000 tons of estate rubber and 225,000 tons of native rubber.

In 1941 the Indies as a whole actually exported 301,000 metric tons of estate rubber and 338,000 metric tons of native rubber. Information on the native areas under rubber has now been made available. It indicates that enough trees have been planted to produce more than 475,000 tons of native rubber annually. And in prewar years the natives of Netherlands India demonstrated that they were the lowest-cost producers of natural rubber.

Dutch Control Limited

At the moment the Dutch are in full control in Borneo, Celebes, Bali, Lombok, and other eastern islands, in Banka and Billiton (the tin islands) and Rhiow, Java and Sumatra are under Allied military jurisdiction, under the British Southeast Asia command, but the Allied occupation extends only to principal ports and (in Java) to a few additional inland towns. Except for the limited areas encompassed within these Allied perimeters, the rest of Java and Sumatra is in the nominal jurisdiction of the Indonesians and commercial operations by the Dutch in those areas are not possible.

Consequently, up to the present time the Dutch activities in rubber have been limited to the collection and sale of stocks in the Allied occupied ports, the stimulation of native rubber production and trade in Borneo and on the limited number of rubber estates in Borneo and Celebes and other small islands under Dutch jurisdiction. In effect they have had to concentrate on the production and trade in native rubber in Borneo. Tapping on a few estates in Java near Batavia was just beginning in early July.

The entire amount of rubber purchased by the Dutch up to the end of May was just under 17,000 metric tons, of which over 8,250 tons was purchased in May; they were just beginning to gain headway; continuation of purchases at the May rate gave them approximately 25,000 tons for the first half of 1946. During the last half of 1946 the Dutch estimated that they would obtain 55,000 from the areas under their jurisdiction.

The writer's own estimate for 1947 is that the Dutch will probably be able to obtain 135,000 tons of rubber, including continued purchases of stocks in Java as well as new production in the areas under Dutch jurisdiction. The Dutch are endeavoring to stimulate the production of native rubber in forms suitable for the world market, encouraging the establishment of small smokehouses, and establishing government-operated remilling factories for slab rubber. Lacking sufficient remilling capacity to handle the slab rubber produced in Borneo, they have contracted with Singapore remillers for remilling some of this production for the time being.

In Interior of Java

This leaves the estate rubber industries in Java and Sumatra—all at present outside Allied control—for consideration. Except in negligible instances no organized

production of rubber was going on in Java in the Indonesian areas this summer. However the stocks on estates in the interior are mostly intact, and buildings and equipment which were left in fair condition when the Japanese surrendered had in most cases suffered only petty pilferage—at any rate on estates in the reoccupied areas, several of which had been inspected by Dutch officials. Practically no rubber has yet been moved from Java except through the Dutch buying operations.

Sumatran Trade with Malaya

In Sumatra in August, 1945, the stocks of rubber at ports and on estates were reported at approximately 50,000 tons, according to Japanese records. No company directed operations of estates in Sumatra is possible at present; it is probable that tapping by natives and former employes is going on to some extent. Large quantities of rubber from Sumatra and nearby islands have been imported into Singapore, Penang, and other Malayan ports, but it is estimated that as of June 30, 1946, 20,000 tons of old stocks still remained to be shipped.

The Malayan statistics of rubber imports show that, during the first half of 1946, 54,255 tons of rubber were imported from Sumatra; 2,162 tons from Borneo, and 2,412 tons from other islands of the Netherlands Indies—a total of 58,829 long tons. The writer's estimate was that a further 8,000 tons of such imports, chiefly in the early months of 1946, were not included in the reported statistics (which, it is understood, did not cover imports into Malacca and Province Wellesley). Upon importation this rubber lost its identity and was subsequently handled by the British the same as rubber of Malayan origin. This trade was actually carried on by Indonesians and Chinese. The Dutch received no financial benefit or allocation credit from this trade. Incidentally, the entire production of Netherlands India had been allocated by the Combined Rubber Committee to the United States for this period. None of this rubber reaching Malaya from the Indies was considered by British authorities to be covered by that allocation.

It is apparent that the major part of this movement consists of newly produced native rubber from southern Sumatra (chiefly the Palembang and Djambi areas). The total arrivals in Malaya from Sumatra have been reported for recent months as follows: April, 13,299 tons; May, 12,322; June, 12,130; July, 14,958; August, 14,099 tons. The rate of movement has shown an upward tendency to date, and, although it is possible that interceptions by Dutch patrol boats may affect this trade, no situation seems likely to develop that will prevent the world for any extended period from obtaining the rubber produced by Sumatran natives.

When a report on Netherlands India was submitted July 9, lacking data for any period later than May, the amount of rubber that would be shipped from Sumatra in the last half of 1946 was estimated at 70,000 tons; it is evident from data *now* available that this figure is likely to be exceeded. The July estimate of the 1947 expected shipments, at 125,000 tons, was intended to be a conservative estimate, and now one seems fully warranted in estimating not less than 150,000 tons' shipments for 1947 from Sumatra. Whether the Dutch, or the Indonesians, Chinese, and British, will benefit from this trade will depend on future developments.

Types of Rubber Available

The stocks of rubber in the producing countries when the Japanese surrendered were large—about 75,000 tons in Malaya, 85,000 tons in Netherlands India, 148,000 (after fire losses) in Indo-China, possibly 12,000 in Siam and British Borneo—or a total of 320,000 tons. These, with the exception of possibly 20,000 tons' stocks in Java, will all have been moved by the end of 1946. Thereafter there will be no more of the blocked and massed old rubber.

It is clear that new rubber reaching consuming countries in 1946 and 1947 will be predominantly of native origin. This fact means more browns and blankets than prewar. While the percentage of native rubber prepared as smoked sheets may increase, this development is not certain, and there will be less first-quality smoked sheets than in prewar years because of the non-operation of estates in Java and Sumatra. The production of first-quality plantation crepes will likewise be limited.

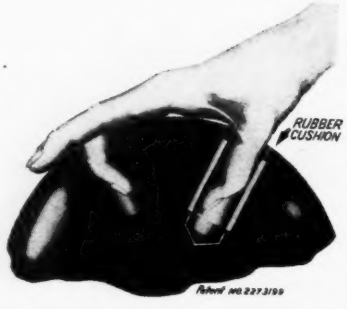
At present the only sources for liquid latex are Liberia and British Malaya. It is estimated that the total amount of latex shipped from the Far East in 1946 will not exceed 4,000 tons d.r.c. Depending upon the speed with which installations of equipment are made, the amount shipped in 1947 from Malaya and other Far Eastern sources might increase to anywhere between 12,000 and 20,000 tons. Meanwhile the contracts under which the United States buys the surplus rubber production of Latin American countries are all due to expire—so the quantities of wild rubber available will dwindle.

On the whole, the types of rubber available for use in 1947 should represent an improvement over 1946. However the types and qualities *stockpiled* during 1947 will obviously affect the material available for factory consumption.

Improved Products for Bowlers

THE Manhattan Rubber Division, Raybestos-Manhattan, Inc., has announced two new developments for bowlers. The "Easy-Hold" principle of bushing the thumb hole of a bowling ball with a rubber cushion, and a new all-rubber bowling alley pit mat.

According to the manufacturer, "Easy-Hold" offers several new advantages to bowlers, including less fatigue, since the squeeze or pressure required to hold 16 pounds of ball is greatly reduced; there is also less slip and tendency to drop the ball, better control, higher scores, and increased bowling pleasure. After a ball has been drilled to suit the individual's grip, the thumb or other finger holes are counterbored, and a special rubber cushion of the same diameter is inserted. This cushion is said to protect the thumb from blisters and knuckle knobs and prevent slipping, at the same time releasing quickly and naturally. Manhattan dealers in all parts of the country have been supplied with jigs especially designed for drilled Manhattan balls and installing the rubber bushing.



Cross-Section of Bowling Ball Showing Manhattan Rubber Bushing for Thumb Hole

Made of rubber that will leave no marks on the pins, the new rubber pit mats have already been acclaimed by operators and bowlers as having many advantages over the conventional rope or coco mats. Shedding of hairs and dirt is eliminated, making it unnecessary for the bowler to clean annoying fuzz from his ball. The mats have no canvas, joints, glue, or stitching, are made of a highly elastic rubber compound which provides good cushioning and sound deadening properties, and will stand up under years of hard wear.

Centrifuging of Latex[1]

I—Experimental Results

G. J. Van Der Bie

IN the Spring of 1939 the author made some experiments, in collaboration with J. A. Aspegren, of the Separator A. B. of Stockholm, on the concentration of latex by centrifuging, using a De Laval centrifuge, type L.770, on the Tjipetir estate. This L.770 machine was not available for further experiments, and since it was desired to obtain some fundamental knowledge concerning the centrifuging of latex, the experiments described in this paper were made in the laboratory at Buitenzorg, using an ordinary milk centrifuge. This machine had the characteristics listed below:

DESCRIPTION OF CENTRIFUGE USED

Type	De Laval L.6
Capacity	20 liters of latex per hour
Space in bowl	700 mls.
Number of disks	27
Inner diameter of cone	50 mm.
Outer diameter of cone	132 mm.
Height of cone	50 mm.
Thickness of disk	0.5 mm.
Distance between disks	ca. 1.5 mm.
R.p.m.	ca. 11,000

Experiments were made using the same batch of field latex; and to avoid major changes in the properties of this latex during the course of the experiments, the length of time for each run was limited to one-half hour.

The efficiency of the centrifuging operation is defined by the proportion;

$$\frac{\text{Cream rubber}}{\text{Latex rubber}} \qquad (1)$$

which can be obtained in % by the use of the formula:

$$\frac{\text{Weight of cream} \times \text{DRC}^2 \text{ of cream}}{\text{Weight of latex} \times \text{DRC of latex}} \times 100 = \% \text{ efficiency} \qquad (2)$$

The loss percentage is given by 100 — % efficiency. The % efficiency can also be calculated from the formula:

$$\frac{\text{Weight of cream} \times \text{DRC of cream}}{\text{Weight of (cream + skim)} \times \text{DRC of latex}} \times 100 = \% \text{ efficiency} \qquad (3)$$

as well as from the formula,

$$\frac{\text{Weight of cream} \times \text{DRC of cream}}{\text{Weight of cream} \times \text{DRC of cream} + \text{weight of skim} \times \text{DRC of skim}} \times 100 = \% \text{ efficiency} \qquad (4)$$

In ordinary practice formula (2) is used as it is quite suitable for long runs. When, however, many experiments are to be made and each experiment is of short duration, formulas (3) and (4) are more satisfactory.

Piddlesden[3] prefers formula (4) because the results obtained will be less erratic from runs of short duration, for example, in the case where samples of cream and skim are taken before equilibrium conditions in the bowl of the centrifuge have been reached. When this equilibrium has been established, the results of both formulas (3) and (4) should differ only slightly.

Accordingly in the experiments described below, formula (4) has been used in calculating the % efficiency. Samples were taken at four-minute intervals during these experiments. It was at first established that equilibrium conditions were reached in the bowl of the centrifuge two minutes after the flow of cream had started.

Details of Experiments

All latex used was presettled, since it was observed in previous experiments that any residual sludge was very troublesome. The feed was regulated by means of a float and a predetermined diameter of the inlet tube.

Each experiment was carried out as follows. After the cream screw had been adjusted to the desired position the centrifuge was started, and within a few moments the latex was allowed to flow into the bowl. (Prefilling the bowl with ammoniated water was found to be unnecessary.) Using a feed rate of 20 liters per hour, the skim started to flow at about the same time the machine had attained its rated number of revolutions. Two minutes were allowed to elapse after the flow of cream began before any samples were taken, in order to be sure that equilibrium conditions in the bowl had been reached. Then at four-minute intervals samples of cream and skim were collected separately, and the quantities obtained were weighted accurately to the nearest gram. Part of each sample was transferred into bottles and kept for further examination. At the end of each run the bowl was emptied, and the next experiment started. When no stabilizer was present, the bowl had to be cleaned of coagulum after six or eight runs. When the latex was stabilized, 50 milliliters of 10% soap solution per liter of latex was used.

Experiment B 31. November, 1939.

Purpose: 1. To test the adjustment of the cream screw in the presence or absence of stabilizer.
2. To determine the influence of variations in the specific gravity of the latex.
3. To determine the influence of variations in the viscosity of the latex used.

Results: See Table 4.

Remarks: The skims from the experiments under 1 above were mixed, and the resulting mixtures, with and without stabilizer and having a DRC of about 4% to 5% were centrifuged again, using a feed rate of 20 l./h. (position of screw one turn out). Some cream was formed, but its viscosity was so high that the cream did not flow out of the bowl. Possibly a greater rate of feed should have been used in this case.

The latex was obtained from Tjiomas and had been presettled for three days. A feed rate of about 20 liters per hour was used.

Experiment B 34. December, 1939.

Purpose: To determine the influence of the DRC of the latex in the presence or absence of stabilizer.

Results: See Tables 5 and 6.

The latex was obtained from Tjiomas and had been presettled for about 40 hours. A feed rate of about 20 l./h. was used. The desired DRC of the latex was obtained by mixing with skim or cream made from the same batch or field latex.

Experiment B 44. January, 1940.

Purpose: To determine the influence of variations in the rate of feed and of the variation in the DRC of the latex, in the presence or absence of stabilizer.

Results: See Tables 7 and 8.

The latex was obtained from Pondok Gedeh and had been presettled for at least 40 hours. The desired DRC of the latex was obtained by mixing with skim or with cream made from the same batch of field latex.

Discussion of Results

When the DRC of the cream and the DRC of the skim of the runs of Experiment B 31, item 1, Table 4, were plotted in Figure 1, it was found that the curves for the latices of varying DRC are situated in separate

[1] Communication of the Rubber Research Institute of Netherlands India, Buitenzorg, Java, July, 1943.
[2] DRC = Dry rubber content.
[3] J. H. Piddlesden, *J. Rubber Research Inst. Malaya*, 10, 78-107 (1940), Comm. No. 250.

Table 4. Experiment B 31

Purpose	Composition of the Latex	Adjustment of screw	Kg. latex per hour	Loss %	D. R. C. Latex	D. R. C. Cream	D. R. C. Skim	Sp. Gr. Latex	Sp. Gr. Cream	Sp. Gr. Skim	Viscosity cps. Latex	Viscosity cps. Cream	Stability Latex (mins)	Stability Cream (mins)
Testing of the bowl	Fresh latex A 5427a (pre-settled during 3 x 24 h) T.S. = 34.8% NH_3 = 4.1 gm./l.	3 out	22.14	2.02	33.4	43.8	3.2	0.979	0.965	1.015	7.2	7.9	8½	3½
		2½ "	20.73	2.76	33.4	46.0	3.9	0.979	0.962	1.014	7.2	9.3	8½	3
		2 "	20.01	3.67	33.4	48.2	4.3	0.979	0.959	1.014	7.2	11.2	8½	2½
		1½ "	20.85	4.67	33.4	50.5	4.9	0.979	0.956	1.013	7.2	13.5	8½	2
		1 "	20.39	5.70	33.4	52.8	5.5	0.979	0.953	1.012	7.2	16.7	8½	1 3/4
		½ "	19.89	6.57	33.4	54.6	5.9	0.979	0.950	1.011	7.2	20.1	8½	1½
		0 "	19.70	7.64	33.4	58.0	6.6	0.979	0.947	1.011	7.2	29.6	8½	1½
		½ in	20.04	8.43	33.4	59.4	7.4	0.979	0.946	1.010	7.2	36.9	8½	1¼
ditto	with stabilizer	3 out	20.88	3.09	32.7	43.7	3.8	0.976	0.963	1.014	4.4	7.5	25	15
		2½ "	20.49	4.90	32.7	47.4	4.9	0.976	0.959	1.013	4.4	9.7	25	12
		2 "	20.30	6.33	32.7	50.0	5.6	0.976	0.954	1.012	4.4	12.2	25	7
		1½ "	20.16	7.97	32.7	54.0	6.2	0.976	0.949	1.011	4.4	17.1	25	6
		1 "	19.46	10.85	32.7	56.7	7.0	0.976	0.949	1.010	4.4	23.8	25	5
		½ "	-	-	32.7	58.2	-	0.976	0.944	1.010	4.4	28.3	25	5
		0 "	-	-	32.7	58.9	-	0.976	0.945	1.010	4.4	31.7	25	4
		½ in	19.55	13.76	32.7	60.0	8.1	0.976	0.943	1.009	4.4	38.7	25	4
Influence of the specific gravity	Diluted with water	0 out	25.11	16.76	21.8	60.0	5.1	0.993	0.942	1.005	2.6	26.6	21	2
	" " skim	0 "	22.85	20.29	21.6	60.8	6.6	0.992	0.944	1.011	3.1	33.3	15	2
	" " " (with Stab.)	0 "	25.02	19.61	22.2	60.3	6.7	0.992	0.944	1.011	3.1	30.3	25	3
	" to 2% sugar content	0 "	24.96	14.44	21.3	59.3	4.5	0.993	0.947	1.014	4.5	57.4	2	1
	" " 4% " "	0 "	25.53	14.79	20.8	58.2	4.7	0.996	0.945	1.021	4.6	-	½	3/4
	" " 6% " "	0 "	25.17	14.84	20.3	58.0	4.5	0.999	0.953	1.030	-	42.8	-	½
	" " 8% " "	0 "	24.83	14.97	19.9	57.7	4.4	1.003	0.953	1.030	-	71.3	-	¼
Influence of viscosity (Latekoll added immediately before run	400 ml. water, 4 liters of latex	0 "	25.40	13.41	28.6	58.9	7.1	0.980	0.945	1.008	4.1	34.1	9	2
	300 ml. water + 100. ml. Latekoll, 10%	0 "	24.35	13.74	28.4	59.3	7.2	0.981	0.944	1.008	4.8	39.3	8½	1
	200 " " +200 " " "	0 "	22.74	12.17	28.3	59.3	6.8	0.981	0.943	1.009	5.4	42.3	8	1
	100 " " +300 " " "	0 "	23.19	11.46	28.7	59.3	6.5	0.981	-	1.009	5.6	44.4	8	1
	0 " " +400 " " "	0 "	21.59	11.23	28.6	59.3	5.7	0.980	-	1.010	7.2	55.5	8	1
	As above, with stabilizer	0 "	24.89	13.84	29.4	59.4	7.4	0.979	0.944	1.007	3.5	36.5	29	5
		0 "	25.37	12.46	29.5	59.8	6.8	0.979	0.941	1.008	4.2	39.6	26½	4
		0 "	25.92	10.79	29.4	59.7	6.6	0.979	0.942	1.008	4.8	41.7	25	4'10"
		0 "	23.87	11.03	29.5	58.5	6.1	0.979	0.940	1.009	5.5	39.3	23	4'25"
		0 "	23.21	10.98	29.6	58.1	5.7	0.979	0.941	1.009	5.6	39.0	21½	4'45"

and distinct regions, according to the DRC of the feed latex. It was also found that the DRC of the cream and the skim for different adjustments of the cream screw are situated in separate and distinct regions.

Specific Gravity of the Latex. A few experiments were made to determine the influence of an increase in the specific gravity of the aqueous phase of the feed latex on the assumption that such an increase should result in an improvement in the efficiency of the centrifuging operation and a decrease in the loss percentage. The increase in the specific gravity of the aqueous phase of the feed latex was brought about by adding varying amounts of a concentrated solution of cane sugar to the feed latex. (See Table 4.) From Table 1, which

Table 1. Effect of Increased Specific Gravity of Latex (Latex Diluted to 20-21% DRC)

	Sp. Gr. Latex	Sp. Gr. Skim	% Loss
Diluted with water	0.993	1.005	16.8
Diluted to 2% sugar content	0.993	1.014	14.4
Diluted to 4% sugar content	0.996	1.021	14.8
Diluted to 6% sugar content	0.999	1.030	14.8
Diluted to 8% sugar content	1.003	1.030	15.0
Diluted with skim	0.992	1.011	20.3
Diluted with skim, plus stabilizer	0.992	1.011	19.6

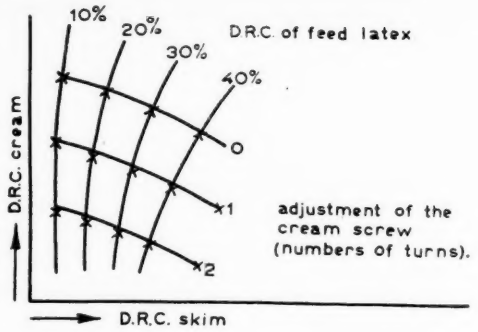


Fig. 1. DRC of Cream *vs.* DRC of Skim for Various Cream Screw Settings

contains selected data from Table 4, it is evident that the loss percentage does decrease upon addition of the cane sugar solution, but only slightly. Moreover the dilution of the feed latex with skim, either with or without addition of a stabilizer, causes the loss percentage to increase while yet increasing the specific gravity of the aqueous phase of the latex.

Apparently the influence on the loss percentage of the presence of stabilizing agents is greater than the influence of small variations in the specific gravity of the aqueous phase of the feed latex.

TABLE 2. EFFECT OF VARIATION OF VISCOSITY OF LATEX

Added to 4 l. Latex		Viscosity in Cps.		
Ml. Water	Ml. 10% Latekoll	Latex	Cream	% Loss
400	0	4.1	34.1	13.4
300	100	4.8	39.3	13.7
200	200	5.4	42.3	12.2
100	300	5.6	44.4	11.5
0	400	7.2	55.5	11.2
Stabilizer Added				
400	0	3.5	36.5	13.8
300	100	4.2	39.6	12.5
200	200	4.8	41.7	10.8
100	300	5.5	39.3	11.0
0	400	5.6	39.0	11.0

DRC feed latex ca. 28%; DRC cream, ca. 59%.

VISCOSITY OF THE LATEX. Experiments made in which varying amounts of 10% Latekoll solution was added to the feed latex indicated that an increase in the viscosity of the feed latex caused a decrease in the loss percentage, even in the presence of a stabilizer. Selected data from Table 4 are tabulated in Table 2.

The viscosity of the cream increases considerably with the addition of Latekoll to the feed latex, but this increase does not occur in the presence of a stabilizer. Apparently the viscosity of the cream itself has only a small influence on the loss percentage.

PRESENCE OF STABILIZER. When plotted in the form of a graph, the curves showing the relations between DRC of cream and DRC of skim appear to be shifted to the right for feed latices with a DRC up to 30%, owing to the presence of a stabilizer. The loss percentage, however, is greater in the presence of a stabilizer. (Tables 5 and 6.)

RATE OF FEED. An increase in the rate of feed appears to shift to the right the curves giving the relations between DRC of cream and DRC of skim when these results are plotted in a graph in the same manner as those in Figure 1.

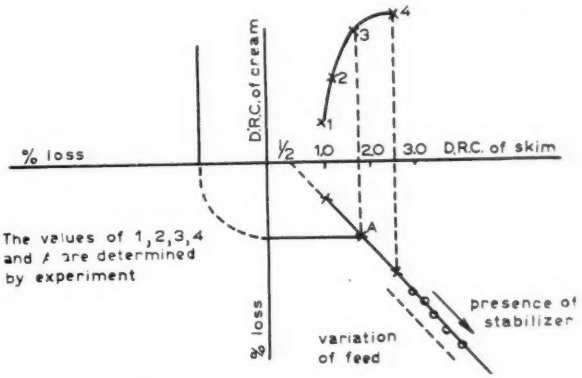


Fig. 3. DRC of Cream *vs.* DRC of Skim and Loss Percentage *vs.* DRC of Skim

RELATION BETWEEN DRC OF FEED LATEX AND LOSS PERCENTAGE. The presence of a stabilizer in the feed latex causes the loss percentage to increase as has been mentioned above. However one very remarkable fact is evident, i.e., *the loss percentage reaches a maximum at a DRC of about 20% total solids of the feed latex.* In Table 3 some of the results from Table 5 are summarized to emphasize this point.

TABLE 3. DRC OF FEED LATEX *vs.* LOSS PERCENTAGE

DRC of Feed Latex	DRC of Cream	% Loss
10.0	62.6	15.8
15.2	62.9	18.8
19.6	62.6	19.9
26.2	61.3	12.8
32.8	60.5	9.4
36.7	60.6	9.0

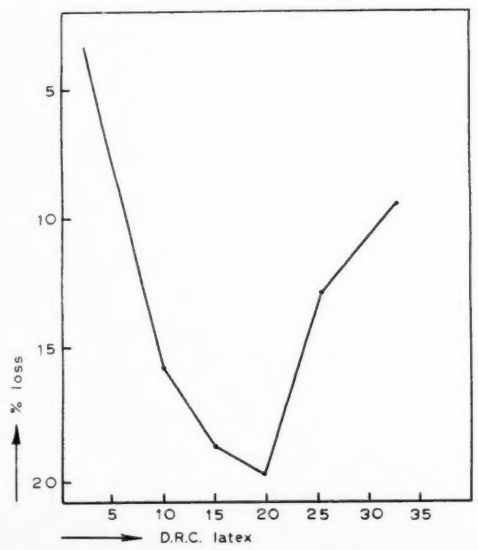


Fig. 2. DRC of Feed Latex *vs.* Loss Percentage

The results in Table 3 are plotted in Figure 2, which, as might be expected, produced a graph consisting of two branches. Why the loss percentage at 10 to 15% DRC of the feed latex is less than that at 20% DRC is not known. The latex contained sufficient ammonia; and since this phenomenon also occurred in the presence of stabilizer, this loss percentage value could not have been affected by the presence of flocculated latex particles.

For the present it can only be stated that the normal tendency for the loss percentage to increase with decreased DRC of the feed latex may depend on the properties of the latex as well as the construction of the centrifuge.

RELATION BETWEEN DRC OF SKIM AND LOSS PER-

Table 5. Experiment B 34

Latex	Adjustment of screw	Kg. latex per hour	Loss %	D. R. C. Cream	D. R. C. Skim	Sp. Gr. Cream	Sp. Gr. Skim	Cream Viscosity	Cream Stability (sec.)
DRC = 10.0%	3 out	22.14	9.7	55.2	1.3	0.944	1.001	17.0	190
TS = 10.8%; NH_3 =	2½ "	-	-	57.1	1.7	0.940	1.000	24.7	165
5.2 gm./l.	2 "	-	-	57.7	1.7	0.940	0.999	26.4	160
Spec. grav. = 0.990	1½ "	-	-	62.4	1.8	0.933	0.999	73.1	80
Viscosity = 1.32 cps.	1 "	19.84	15.8	62.6	1.9	0.930	0.999	89.6	75
Stability > 30 min.	½ "	-	-	62.9	1.9	0.928	0.999	123.1	60
	0 "	19.98	17.9	63.0	2.0	0.925	0.999	123.8	60
DRC = 15.2%	3 out	19.46	9.5	53.8	1.9	0.946	1.003	15.2	175
TS = 16.4%; NH_3 =	2½ "	19.77	12.0	57.1	2.3	0.943	1.003	23.7	140
3.2 gm./l.	2 "	-	-	56.5	2.4	0.944	1.003	20.4	150
Spec. grav. = 0.988	1½ "	-	-	58.9	2.7	0.938	1.002	32.6	115
Viscosity = 1.77 cps.	1 "	19.64	14.0	59.5	2.7	0.938	1.002	34.4	105
Stability = 31 min.	½ "	-	-	61.1	2.7	0.936	1.002	48.6	85
	0 "	19.80	18.8	62.9	3.5	0.933	1.002	82.5	70
	½ in	-	-	64.4	3.3	0.925	1.002	178.0	55
DRC = 19.6%	3 out	-	-	50.9	2.9	0.950	1.004	11.5	165
TS = 20.6%; NH_3 =	2½ "	-	-	54.1	2.9	0.946	1.004	16.0	90
3.6 gm./l.	2 "	-	-	55.8	2.9	0.944	1.004	18.8	75
Spec. grav. = 0.985	1½ "	24.97	13.3	58.1	3.6	0.941	1.003	27.9	70
Viscosity = 2.21 cps.	1 "	24.84	14.6	59.3	3.9	0.930	1.002	35.8	75
Stability = 5 min.	½ "	-	-	61.0	4.1	0.934	1.002	52.6	110
	0 "	-	-	61.9	4.3	0.932	1.002	70.4	45
	½ in	25.76	19.9	62.6	5.1	0.930	1.001	87.2	60
DRC = 26.2%	3 out	-	-	48.1	3.7	0.951	1.008	9.7	140
TS = 27.6%; NH_3 =	2½ "	23.51	7.3	51.8	3.7	0.950	1.008	12.8	120
3.0 gm./l.	2 "	22.96	8.3	54.6	3.9	0.949	1.008	17.0	100
Spec. grav. = 0.980	1½ "	23.44	9.0	56.8	4.2	0.947	1.008	22.0	85
Viscosity = 3.42 cps.	1 "	22.70	9.9	57.9	4.5	0.945	1.007	27.2	80
Stability = 7 min.	½ "	21.94	10.9	59.4	4.5	0.944	1.007	35.0	70
	0 "	25.24	12.8	61.3	5.7	0.943	1.006	47.9	70
DRC = 32.8%	3 out	-	-	44.5	3.8	0.963	1.013	8.1	280*
TS = 34.9%; NH_3 =	2½ "	-	-	48.0	4.0	0.960	1.013	9.2	245
3.4 gm./l.	2 "	-	-	50.2	4.5	0.956	1.013	12.1	200
Spec. grav. = 0.997	1½ "	22.82	6.3	53.8	5.1	0.952	1.012	16.8	245
Viscosity = 6.55 cps.	1 "	22.26	7.2	56.7	5.4	0.944	1.011	23.2	235
Stability = 10 min.	½ "	-	-	58.4	5.9	0.946	1.010	31.2	115
	0 "	21.36	8.4	58.8	5.9	0.945	1.010	33.6	110
	½ in	20.88	9.4	60.5	6.5	0.944	1.010	43.4	85
DRC = 36.7%	3 out	-	-	48.5	5.5	0.958	1.012	11.4	200
TS = 38.9%; NH_3 =	2½ "	-	-	52.1	6.2	0.954	1.012	15.4	160
3.7 gm./l.	2 "	-	-	46.9	5.5	0.960	1.013	10.2	200
Spec. grav. = 0.973	1½ "	-	-	49.3	5.3	0.957	1.013	12.3	180
Viscosity = 7.86 cps.	1 "	-	-	56.5	4.5	0.947	1.014	28.6	90
Stability = 7 min.	½ "	18.32	6.0	57.4	5.8	0.948	1.012	29.8	80
	0 "	-	-	57.0	7.1	0.947	1.011	30.0	95
	½ in	18.62	7.1	59.8	6.9	0.944	1.011	43.7	70
	1 in	12.10	9.0	60.6	7.9	0.942	1.010	53.5	75
DRC = 40.5%	3 out	-	-	74.2	6.8	0.960	-	11.6	170
TS = 42.4%; NH_3 =	2½ "	-	-	49.3	7.6	0.957	-	13.5	145
3.4 gm./l.	2 "	-	-	49.5	6.7	0.958	1.011	13.7	135
Spec. grav. = 0.986	1½ "	20.86	3.1	52.0	6.0	0.954	1.011	17.4	105
Viscosity = 9.16 cps.	1 "	21.04	3.7	54.1	6.9	0.951	1.011	21.8	85
Stability = 5 min.	½ "	20.78	4.6	55.2	7.3	0.950	1.010	27.8	85
	0 "	20.68	5.6	57.3	8.5	0.947	1.009	35.8	70
	½ in	-	-	57.8	8.7	0.946	1.008	39.3	75
DRC = 44.9%	2 out	-	-	57.4	18.5	0.945	0.996	39.5	135
TS = 46.4%; NH_3 =	1½ "	-	-	59.0	15.0	0.942	-	37.4	135
3.9 gm./l.	1 "	-	-	59.4	14.0	0.944	-	39.5	160
Spec. grav. = 0.961	½ "	-	-	60.8	11.8	0.943	-	50.8	90
Viscosity = 10.6 cps.	0 "	-	-	58.6	5.3	0.946	1.011	48.2	120
Stability = 5 min. 20 sec.									

CENTAGE. It was found that the line representing the relation between the "ordinary" DRC of the skim and the real DRC (% of pure rubber hydrocarbon), determined according to the method of Van Gils, does not pass through the zero point, but that 0% of the real DRC corresponds to +½% of the ordinary DRC. Consequently this ½% "ordinary" DRC probably consists of a non-rubber fraction, presumably a protein.

It will be obvious that when a relation between the DRC of the skim and the loss percentage, is looked for

Table 6. Experiment B 34

Latex	Adjustment of screw	Kg. latex per hour	Loss %	D. R. C. Cream	D. R. C. Skim	Sp. Gr. Cream	Sp. Gr. Skim	Cream Viscosity	Cream Stability (min.)
DRC = 10.7%	3 out	19.13	10.4	53.3	1.2	0.994	1.001	14.4	15
TS = 11.0%	2½ "	18.99	11.3	56.4	1.3	0.941	1.001	19.9	13
NH_3 = 3.4 gm./1.	2 "	-	-	57.0	2.0	0.940	1.001	20.5	10½
Spec. grav. = 0.991	1½ "	-	-	59.4	1.9	0.935	1.001	33.2	8½
Viscosity = 1.25 cps.	1 "	19.67	16.4	60.8	1.9	0.934	1.001	43.9	10½
Stability = 30 min.	½ "	-	-	62.3	2.4	0.933	1.001	62.9	9
	0 "	20.66	19.4	62.8	2.2	0.928	1.001	88.6	9
DRC = 15.7%	3 out	21.04	10.5	52.9	2.2	0.947	1.004	13.1	16½
TS = 16.6%	2½ "	21.51	11.5	54.5	2.4	0.946	1.004	15.4	15
NH_3 = 3.1 gm./1.	2 "	21.82	12.8	56.4	2.6	0.944	1.003	19.6	12
Spec. grav. = 0.987	1½ "	21.96	14.1	57.6	2.8	0.943	1.003	22.6	11
Viscosity = 1.64 cps.	1 "	19.21	15.9	60.0	3.1	0.941	1.003	37.7	9
Stability = 30 min.	½ "	19.05	18.7	62.5	3.6	0.936	1.003	72.3	8
	0 "	-	-	63.2	3.7	0.935	1.002	96.2	6
DRC = 20.8%	3 out	-	-	47.1	4.0	0.956	1.005	8.5	21
TS = 22.2%	2½ "	-	-	53.4	3.8	0.948	1.005	14.6	15½
NH_3 = 3.6 gm./1.	2 "	22.03	12.2	54.6	3.8	0.947	1.005	14.2	15½
Spec. grav. = 0.985	1½ "	-	-	56.4	3.8	0.945	1.005	20.1	13
Viscosity = 2.03 cps.	1 "	22.05	14.2	57.0	4.3	0.944	1.004	21.7	10½
Stability = 30 min.	½ "	21.84	16.2	59.8	4.8	0.941	1.004	36.3	9
	0 "	-	-	60.6	4.8	0.940	1.004	45.8	9½
	½ in	-	-	61.1	6.4	0.940	1.002	58.7	7
DRC = 26.1%	3 out	-	-	42.8	4.8	0.963	1.008	8.9	23½
TS = 27.7%	2½ "	-	-	47.1	5.7	0.958	1.007	8.9	23
NH_3 = 3.8 gm./1.	2 "	-	-	54.9	4.2	0.949	1.009	17.5	13½
Spec. grav. = 0.983	1½ "	-	-	57.1	4.3	0.947	1.009	23.5	12
Viscosity = 2.67 cps.	1 "	-	-	58.6	4.4	0.945	1.009	30.1	10
Stability = 30 min.	½ "	-	-	59.0	5.8	0.942	1.008	38.4	10
	0 "	-	-	61.0	4.5	0.942	1.008	45.4	8
	½ in	-	-	62.2	5.2	0.938	1.008	76.0	7
DRC = 29.3%	3 out	20.68	4.6	47.0	3.4	0.958	1.012	9.3	25
TS = 31.3%	2½ "	-	-	50.7	4.8	0.954	1.010	13.4	15
NH_3 = 3.2 gm./1.	2 "	-	-	53.5	5.4	0.951	1.010	18.1	15
Spec. grav. = 0.980	1½ "	20.70	8.2	55.8	5.0	0.947	1.010	25.3	13½
Viscosity = 3.41 cps.	1 "	-	-	57.5	4.7	0.947	1.008	27.5	11½
Stability = 30 min.	½ "	-	-	58.3	6.3	0.944	1.008	36.5	11½
	0 "	21.38	11.2	59.7	6.3	0.943	1.008	47.5	9
DRC = 35.4%	3 out	19.34	2.5	45.8	4.3	0.961	-	8.5	26
TS = 37.6%	2½ "	19.38	3.3	48.6	4.6	0.958	-	10.4	20½
NH_3 = 3.5 gm./1.	2 "	-	-	52.2	7.8	0.953	1.010	14.2	17½
Spec. grav. = 0.974	1½ "	-	-	54.7	4.8	0.947	1.013	18.3	15
Viscosity = 4.79 cps.	1 "	20.48	5.6	56.1	5.7	0.948	1.012	21.1	13
Stability = 37 min.	½ "	-	-	58.6	5.0	0.944	1.013	29.7	11
	0 "	-	-	59.4	5.7	0.943	1.012	34.5	9
DRC = 41.4%	3 out	-	-	48.8	5.5	0.956	-	10.4	20
TS = 43.9%	2½ "	-	-	51.9	9.4	0.932	-	13.4	17
NH_3 = 4.0 gm./1.	2 "	-	-	52.8	3.3	0.951	-	14.4	17
Spec. grav. = 0.965	1½ "	-	-	54.5	3.8	0.949	-	16.6	14½
Viscosity = 6.49 cps.	1 "	-	-	56.4	4.4	0.947	-	21.4	13
Stability = 33½ min.	½ "	-	-	59.0	3.7	0.944	-	31.8	10
	0 "	-	-	60.3	3.7	0.941	-	39.0	9½
	½ in	-	-	60.7	5.1	0.939	-	47.7	10

exclusively, the quantity and the total mass of the rubber particles must be taken into account, in other words the real DRC. However, owing to the great number of samples taken, only the ordinary DRC of the skim was determined, as has been indicated in the tables of data.

Now it appears *that the curves indicating the relations between the DRC of the skim and the loss percentage are practically rectilinear and converge to the point, +½% DRC of skim.* Hence if the curve relating the DRC of cream and the DRC of skim is known, all that is necessary is to determine the loss percentage of one point on this curve, and then all other points must be on the line which connects this point in the DRC of skim-loss percentage curve with the point, +½% DRC of skim. (See Figure 3.)

Further, it was found that the tangents of these lines are determined chiefly by the DRC of the latex, the presence of a stabilizer only causes a shifting along the line, and a change of feed rate causes only a slight deviation in the tangents so that the regions of different DRC of the feed latex remain clearly separated.

Summary and Conclusions

These observations should enable the establishment

Table 7. Experiment B 44

Feed Latex	Adjustment of screw	5 Kg./hour Kg./hour	D. R. C. Cream	Skim	Loss %	10 Kg./hour Kg./hour	D. R. C. Cream	Skim	Loss %	15 Kg./hour Kg./hour	D. R. C. Cream	Skim	Loss %
DRC = 9.1%	3 out	5.35	59.4	0.6	4.9	9.92	55.3	0.9	9.1	14.91	57.2	1.1	8.4
TS = 9.8%	2 "	-	-	-	-	-	-	-	-	15.51	61.6	1.3	11.9
NH_3 = 5.8 gm./l.	1½ "	-	-	-	-	-	-	-	-	-	-	-	-
Viscosity = 1.26 cps.	1 "	-	-	-	-	9.81	60.7	1.2	10.9	15.12	61.8	1.6	15.5
Stability = 25 min.	½ "	5.10	62.4	0.8	8.2	9.86	64.6	1.5	14.8	-	-	-	-
	0 "	5.10	62.9	0.9	9.8	-	-	-	-	-	-	-	-
DRC = 19.1%	3 out	5.57	58.9	1.5	5.7	-	-	-	-	15.44	52.3	2.5	8.6
TS = 20.7%	2 "	-	-	-	-	9.73	56.4	2.5	8.8	15.72	56.8	3.0	10.9
NH_3 = 5.5 gm./l.	1½ "	-	-	-	-	-	-	-	-	15.34	58.8	3.2	11.6
Viscosity = 2.11 cps.	1 "	6.03	60.1	1.8	6.6	-	-	-	-	15.96	60.0	3.6	13.3
Stability = 8 min.	½ "	5.93	63.3	2.3	8.1	10.34	62.4	3.1	11.6	14.98	60.9	3.8	14.4
	0 "	-	-	-	-	9.67	64.5	3.5	13.8	-	-	-	-
DRC = 28.0%	3 out	-	-	-	-	10.44	51.6	4.0	5.7	-	-	-	-
TS = 29.5%	2 "	-	-	-	-	9.82	55.2	4.5	8.2	-	-	-	-
NH_3 = 6.0 gm./l.	1½ "	-	-	-	-	-	-	-	-	15.30	57.1	5.2	9.4
Viscosity = 3.88 cps.	1 "	-	-	-	-	11.04	59.6	6.0	10.8	-	-	-	-
Stability = 6½ min.	½ "	-	-	-	-	10.58	60.4	5.9	11.6	-	-	-	-
	0 "	-	-	-	-	10.4	61.8	6.5	13.4	15.44	60.1	6.9	13.8
	½ in	-	-	-	-	-	-	-	-	15.52	62.0	8.2	17.2
DRC = 38.6%	1½ out	5.13	58.3	3.6	3.1	-	-	-	-	15.14	55.4	4.8	3.5
TS = 40.3%	1 "	-	-	-	-	-	-	-	-	14.74	56.4	5.4	4.5
NH_3 = 5.7 gm./l.	½ "	5.60	60.7	5.3	4.0	-	-	-	-	15.78	58.4	7.4	6.0
Viscosity = 5.58 cps.	0 "	5.62	62.3	8.0	5.5	-	-	-	-	-	-	-	-
Stability = 3½ min.													

Table 8. Experiment B 44

Feed Latex	Adjustment	5 Kg./hour Kg./hour	D. R. C. Cream	Skim	Loss %	10 Kg./hour Kg./hour	D. R. C. Cream	Skim	Loss %	15 Kg./hour Kg./hour	D. R. C. Cream	Skim	Loss %
DRC = 10.4%	3 out	-	-	-	-	11.58	55.4	1.1	9.0	-	-	-	-
TS = 11.4%	2 "	4.80	61.0	0.9	11.3	10.90	59.7	1.2	10.0	13.96	55.8	1.4	11.9
NH_3 = 5.0 gm./l.	1½ "	5.43	62.8	1.4	15.1	10.58	61.4	1.3	10.4	-	-	-	-
Viscosity = 1.12 cps.	1 "	-	-	-	-	-	-	-	-	15.62	57.1	1.6	12.7
Stability = 30 min.	(? Ed.)	-	-	-	-	10.52	62.1	1.5	12.6	13.44	60.6	1.8	15.8
DRC = 20.5%	3 out	-	-	-	-	-	-	-	-	-	-	-	-
TS = 21.7%	2 "	6.45	55.2	1.8	5.8	-	-	-	-	15.58	54.3	3.5	11.1
NH_3 = 5.6 gm./l.	1½ "	6.00	58.6	1.9	6.5	-	-	-	-	-	-	-	-
Viscosity = 1.98 cps.	1 "	5.74	61.7	2.3	7.7	-	-	-	-	-	-	-	-
Stability = 11½ min.	½ "	5.60	62.8	2.6	9.9	-	-	-	-	-	-	-	-
	0 "	-	-	-	-	-	-	-	-	15.44	58.6	4.2	13.5
	½ in	-	-	-	-	-	-	-	-	15.04	60.2	4.3	15.3
	1 "	-	-	-	-	-	-	-	-	14.48	61.6	4.6	17.8
DRC = 29.9%	3 out	5.78	55.5	2.4	3.5	9.18	50.4	2.6	3.2	-	-	-	-
TS = 31.4%	2 "	-	-	-	-	-	-	-	-	15.84	53.4	3.6	5.4
NH_3 = 5.9 gm./l.	1½ "	-	-	-	-	-	-	-	-	15.09	55.5	4.0	5.9
Viscosity = 3.76 cps.	1 "	-	-	-	-	-	-	-	-	-	-	-	-
Stability = 9½ min.	½ "	5.28	60.4	2.9	5.0	9.46	58.7	2.9	4.7	14.76	58.1	4.4	7.3
	0 "	4.98	62.2	3.7	6.0	9.34	60.1	3.3	5.7	-	-	-	-
	½ in	4.92	62.6	4.3	7.3	9.16	61.5	3.7	6.7	13.65	60.6	5.7	9.7
	1 "	-	-	-	-	9.10	62.2	4.2	8.7	-	-	-	-
DRC = 40.2%	2 out	-	-	-	-	-	-	-	-	14.86	48.4	2.9	1.3
TS = 41.9%	1½ "	-	-	-	-	-	-	-	-	-	-	-	-
NH_3 = 5.1 gm./l.	1 "	-	-	-	-	-	-	-	-	14.12	52.6	4.0	2.3
Viscosity = 5.79 cps.	½ "	-	-	-	-	9.16	57.7	2.7	2.1	15.16	54.4	4.6	3.0
Stability = 8 min.	0 "	-	-	-	-	9.96	59.2	3.8	3.1	15.56	55.6	5.4	3.8
	½ in	-	-	-	-	-	-	-	-	-	-	-	-
	1 "	-	-	-	-	9.56	61.1	6.0	5.8	14.94	57.8	6.2	4.8

of a method for the classification of cream separators according to the relations between the efficiency, the quality of cream, and the rubber content of the feed latex.

A Simple Cold Test for Vulcanized Polymers

Harold M. Leeper[1]

THE freeze resistance of vulcanized polymers has been evaluated for the past two years at this laboratory[1] by a method which involves measurements of primary creep at successively lower temperatures. This method has been found to be particularly useful when it is desired to know, within 5° or 10° F., the temperature at which the polymer ceases to function as a rubber-like material. In a laboratory of this kind, where considerable work is done in evaluating new polymer types and where the polymerization variables studied often are of such a nature as to produce relatively large changes in the freeze resistance of the vulcanized polymer, a tolerance of 5° to 10° F. has been found to be a workable value. The test is simple and can be carried out with the shore A durometer or the A.S.T.M. hardness tester, one or both of which are generally available in a rubber laboratory. Its simplicity notwithstanding, the test is reasonably objective.

Both the durometer and the A.S.T.M. tester are handled in the conventional manner, and readings are taken five and 30 seconds, respectively, after the pressure plate or presser foot contacts the specimen. The degree of creep is recorded as the difference in hardness points between these two readings.

It is a matter of experience that for most polymers the amount of creep or flow exhibited at successively lower temperatures increases gradually, reaches a maximum, and then begins to decrease at a relatively high rate. The temperature at which this rapid drop-off occurs is considered significant because at this point the polymer begins to lose, at an accelerated rate, the fluidity which it had at higher temperatures and is being transformed into a hard, non-rubber-like material.

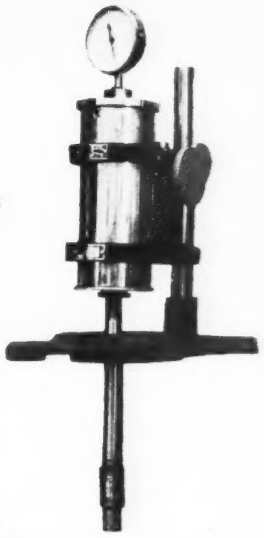
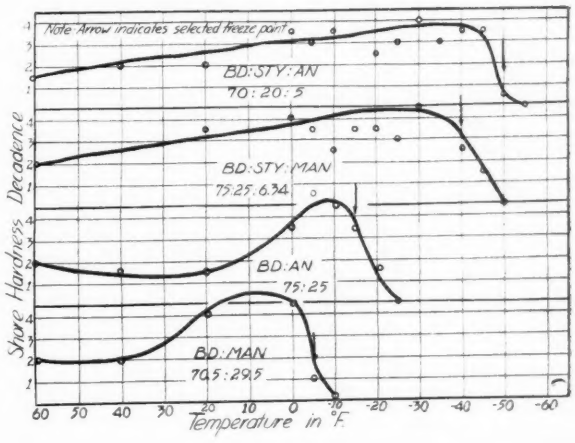


Fig. 2. Madified A.S.T.M. Hardness Tester

Fig. 3. (Below) Shore Durometer Creep Data



Details of Test Method

In running the Shore hardness decadence tests this laboratory uses a cabinet of the mechanical convection type cooled with solid carbon dioxide. The specimens, which measure two by 1¼ by 9/16 inches, are mounted on a circular stage which can be revolved from the outside by means of a gear system. The durometer, kept inside the cabinet during the tests, is attached to a steel shaft which extends through the top of the box and is free to move vertically. The rod is weighted at the top to provide the proper pressure on the durometer. Readings are taken through a window mounted in the front wall. The interior of the box is illustrated in Figure 1. The cabinet need not be so elaborate as this to obtain satisfactory results. This apparatus was designed for convenience and speed in handling a large number of samples. Although the durometer may be hand-actuated, experience with this instrument indicates that gravity-actuation is considerably more desirable. The samples should be at least ½-inch thick and the lateral dimensions large enough to permit 18 to 24 readings at different points on the surface.

The A.S.T.M. tester is used in conjunction with a sample conditioning bath of methanol. Solid carbon dioxide is used as the cooling agent. A slight modification was made in the instrument for the purposes of this test; the presser foot and indentor shaft were extended to a length of about eight inches to permit tests to be run under the methanol while the body of the tester is supported above the liquid on the edge of the tank.

(*Continued on page 222*)

[1] The University of Akron Government Laboratories, Akron, O.

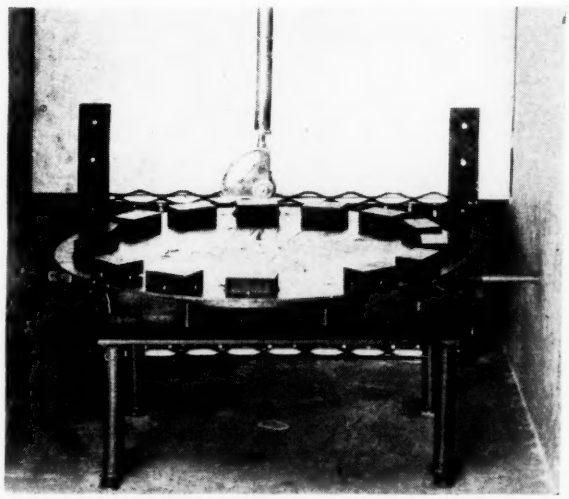


Fig. 1. Cold Test Apparatus Using Shore Durometer

Recent Russian Literature on Natural and Synthetic Rubber—XXIV

M. Hoseh

CORD for Belts. A. P. Chelyuk and F. M. Sokolovskaya, *Kauchuk i Rezina*, 9, 45-49, (1940). **M-29.**

The importance of cord for the quality of belts is discussed. Several kinds of cords are analysed, and their advantages and disadvantages discussed. The qualities of cord, as determined by its twist, elongation, direction of twist, tension of fiber during cording, and by such practices as wet twisting, vacuum treatment, and saturating the fiber with adhesive substances, are discussed.

The Effect of Temperature on Cord. E. Ya. Yaminskaya, *Kauchuk i Rezina*, 9, 49-52, (1940). **M-30.**

Since cotton used for making cord is hygroscopic, and cord within a tire is exposed during manufacture and use to elevated temperatures, it can be expected that those temperatures which affect the moisture content of the cord will also affect its mechanical properties. Experiments, described in detail, were conducted to determine the effect of temperature on cotton and viscose cords. The two kinds of cord were differently affected. The temperatures to which the cords were exposed were 80-120° C. for 24, 48, and 72 hours. At the higher temperatures the strength of the cotton cord dropped considerably; whereas the viscose cord showed an improved strength. The strength of cord used in tires should be calculated on the basis of temperatures at which the tire works rather than on the basis of controlled temperature and humidity.

Metal Spraying of Vulcanization Kettles as Means of Corrosion Prevention. E. A. Davidovskaya, *Kauchuk i Rezina*, 9, 71-75, (1940). **SN-105.**

Many protective coating were tried out to determine their corrosion inhibiting effect and stability in vulcanization kettles. Aluminum applied to the upper part of the kettle stood up very well and showed no deterioration after 20 months of service. On the bottom of the kettle, where the aluminum coating was in contact with condensate, the Al film was corroded. Lead coating fared badly in the upper as well as in the lower part of the kettle. In the upper part of the kettle it formed PbS; on the floor and along the ridges the Pb lining buckled. Zinc was entirely unsatisfactory as coating. Combination of Zn and Al and of Zn and Pb were equally unsatisfactory. A Bakelite varnish (No. 17 k) applied directly to the iron wall or on an Al coat in the upper part of the kettle cracked after two months of service. On the bottom of the kettle it withstood 9-10 months and only then cracked to an insignificant extent. Thus the upper part of the kettle is best protected by an Al coat 0.3-0.4-mm. thick. On the bottom, where the Al is adversely affected by the condensate, an additional coat of bakelite varnish should be provided.

Extrusion Method for Curing Bags. V. A. Vereikin, *Kauchuk i Rezina*, 9, 77-78, (1940). **SN-106.**

A step by step description is given of an extrusion process for making curing bags as practiced in the Leningrad tire plant. The extrusion apparatus used are Berstorff or Adamson.

Changing the Assembly Methods of Galoshes. A. G. Suvorov, *Kauchuk i Rezina*, 9, 81-82, (1940). **SN-107.**

Some suggestions are made for changes in the assembly method of galoshes, which are expected to lower material consumption, increase production and reduce waste. These changes concern primarily the shape of the lining, heel, and counter.

New Raw Material for the Rubber Industry. F. I. Yashunskaya, *Kauchuk i Rezina*, 10, 1-7, (1940). **S-65.**

A condensed characterization appears of the properties of polyisobutylene and polyvinyl elastomers such as Igelite, Koroseal, Mipolam, and others compiled from Russian and foreign literature. Twenty-eight references are quoted.

Some Physico-Chemical Properties of Carbon Black. T. Patrin and S. Pilat, *Kauchuk i Rezina*, 10, 14-16 (1940). **M-31.**

Determinations were made of the absorption of CCl_4 vapors by various types of carbon black and of the heat of wetting of various kinds of C black by CCl_4. There were also determined the oil number and the temperature of spontaneous combustion of a number of carbon blacks. The oil number is defined as the quantity of linseed oil absorbed by the carbon black. The temperature of spontaneous combustion is defined as the temperature at which a sample of carbon black will ignite in a stream of oxygen. The method and apparatus used in this determination are described by W. Swietosawski and B. Roga.[1]

All these determinations were intended to establish a correllation between their values and the behavior of carbon black in rubber mixes. No such correllation could be found between the oil number of carbon black and the behavior of the latter. The values of CCl_4 absorption and those of the heat of wetting run parallel. The absorption values for the various carbon blacks tested varied from 0.83% wt. for Thermax to 61.5% wt. for Super-Spectra, a carbon black obtained by incomplete combustion of natural gas and having a high coloring power. The heat of wetting varied from 0.1 cal./gr. for Thermax to 6.5 cal./gr. for Super-Spectra. The values of absorption and of the heat of wetting are quite indicative of the origin of the carbon black. While there is some correllation between the temperature of ignition and the absorptive capacity, the ignition temperature is more indicative of the origin of the carbon black. With respect to their ignition temperatures carbon black can be divided into: acetylenic, thermic, lamp black, active gas black, and blacks having a high coloring power.

(Continued on page 284)

[1] *Przemysl Chemi.*, 12, 18 (1928).

Hysteresis and Methods for Its Measurement in Rubber-Like Materials—II

J. H. Dillon[1] and S. D. Gehman[2]

VIBRATION devices in which resonance is purposely avoided are generally termed flexometers in the rubber industry. In general, a flexometer operates under a more or less arbitrarily chosen set of conditions aimed at developing heat in a rubber sample which can be measured as temperature rise.

Fig. 16. Firestone Flexometer

Forced Vibration. Non-Resonance Methods

The ability to withstand "blowout" is also measured in some flexometers, but, since this involves chemical resistance of the stocks to heat as well as hysteresis losses, the blowout feature will not be discussed in this paper. Furthermore the permanent static deflection of the rubber sample after a definite cycle of testing is usually obtained, but, because of its indirect relation to hysteresis, will not be considered here. The temperature rise for given sample size and shape under any controlled set of conditions depends to some extent on the thermal conductivity and the rate of loss of heat to the surroundings by radiation and convection. Fortunately the thermal conductivity is very nearly the same for the common rubber-like polymers; so, for a given sample size and shape, the measured temperature rise is primarily a measure of the hysteresis losses *under the particular set of conditions employed.* The choice of the conditions of static and dynamic stress and strain is, however, very important and has been unfortunate in some cases.

The Firestone flexometer (27)[3] has been of considerable value to rubber compounders. It is shown schematically in Figure 15. A photograph of the apparatus is shown in Figue 16. A rubber sample approximately one inch by two inches by 1½ inches high is placed between Bakelite inserts in the top and the bottom platens. A vertical dead load, L, is applied, and the bottom platen is caused to rotate in a race in such a manner that the sample is subjected to a constant shear amplitude with continuously rotating shear axis. This motion is particularly convenient for routine testing since it does not require accurate centering of the sample. As the test progresses, the temperature rises to an equilibrium value where the rate of heat generation is just balanced by the heat losses. The equilibrium temperature is measured with a needle thermocouple. As the temperature rises, however, the sample deforms to an increasing extent so that the condition is not strictly constant shear amplitude under constant vertical compressive load. If no permanent deformation takes place (a highly idealized condition) and if the initial sample height is y_1, the final height y_2, the constant throw x', then the change in height during the test is

$$y_1 - y_2 = \frac{L}{A_1 E_{st}} \qquad (30)$$

where E_{st} is the effective static modulus of compression at the equilibrium temperature, including the shape factor, and A_1 is the undeformed load area. If e_{max} is the maximum shear strain at the equilibrium temperature, then the constant throw is

$$x' = e_{max}\, y_2 = e_{max}\left(y_1 - \frac{L}{A_1 E_{st}}\right) = \text{Const.} \qquad (31)$$

Thus the flexometer operates under a complex condition where neither the shear stress nor shear strain is constant. The common occurrence of permanent deformation during the test further complicates the conditions. Thus, only when the stocks to be compared have about

[1] Research laboratory, Firestone Tire & Rubber Co., Akron, O.
[2] Research laboratory, Goodyear Tire & Rubber Co., Akron, O.
[3] Bibliography references appear at end of this article.

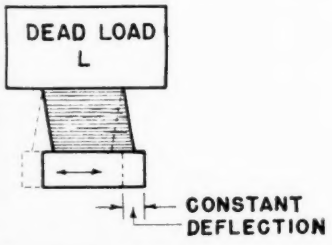


Fig. 15. Firestone Flexometer Constant Static Load; Constant Shear Amplitude; Temperature Rise Measured

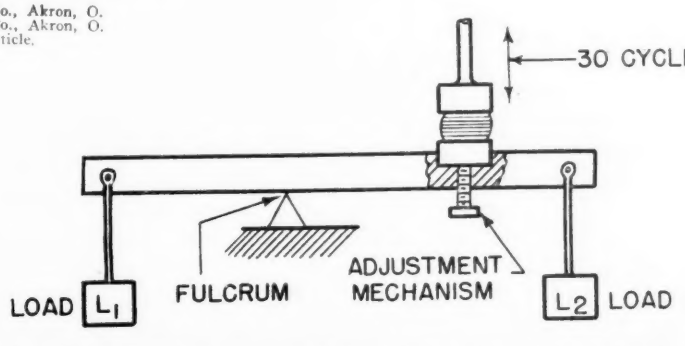


Fig. 17. Goodrich Flexometer—Constant Static Load or Initial Static Deflection; Constant Compressive Amplitude; Temperature Rise Measured

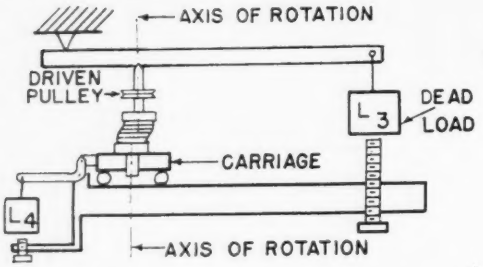


Fig. 18. St. Joe Flexometer—Constant Static Load or Deflection; Constant Shear Load or Amplitude; Temperature Rise Measured

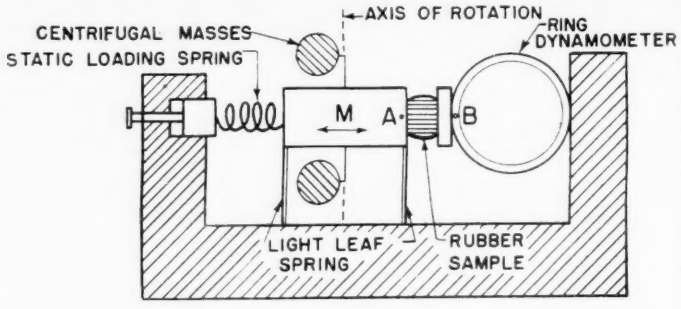


Fig. 19. Roelig Apparatus—Constant Static Load; Constant Dynamic Load—Measures Area of Dynamic Hysteresis Loop by Means of Mirrors Actuated by Points A and B.

the same value of E_{st}, does the machine give dependable relative values of the heat generation at constant strain. The results are thus difficult to interpret in terms of the hysteresis defect. It should be pointed out, however, that the flexometer could be adapted to constant vertical deflection tests by clamping the top platen after loading the sample to a fixed deflection. In that case, essentially constant shear strain conditions would prevail. Preliminary trials, however, have shown that this technique results in horizontal motion of the specimens across the platens.

The Goodrich flexometer (28), like the Firestone flexometer, employs a constant amplitude and is mechanically driven. However the dynamic deflection is compressive. The compound load system (see Figure 17) is designed to have a low natural frequency of oscillation on the fulcrum. The position of the lower platen may be adjusted while the machine is operating so that the load arm remains approximately horizontal at all times so that the compressional load is constant. As in the case of the Firestone flexometer, the sample generally assumes a permanent deflection in the course of the test. Thus, although the total load is constant, the static stress varies. Comparisons may be made either with constant initial compression or constant initial load. Equilibrium temperatures are measured with a thermal junction between the sample and the insulating platen insert or, in some cases, with the junction embedded in the sample. In the former case it should be noted that since no heat is generated at the end of the sample by flexing, the thermocouple is heated by heat flow from the center, hardly a desirable situation. The machine is somewhat smaller than the Firestone flexometer and employs a smaller rubber sample (0.7-inch diameter by 1.0-inch height or smaller). Since neither the static stress nor static strain is constant during a test, unless the load is changed manually in proper proportion to the static deflection, complex conditions of test similar to those given for the Firestone flexometer exist. (See Equation 31). The machine is equipped with an oven which permits tests at a controlled elevated ambient temperature.

The St. Joseph Lead Co. flexometer (29) is considerably more versatile in regard to conditions of test than either the Firestone or Goodrich flexometers. The cylindrical rubber sample (see Figure 18) may be subjected to either constant vertical load or constant vertical deflection, but the first condition appears to be more generally used because of the tendency of the samples to slip out of the machine under constant compression. The horizontal shear motion is produced by rotating the top and bottom platens about independent vertical axes which may be relatively displaced either by a constant horizontal load or a constant horizontal deflection. Thus it is possible to make equilibrium temperature measurements with constant static compressive strain with either constant horizontal shear strain or shear stress from which relative values of H_γ or H_σ (see Equation 28)[4] should be obtained by calculation from the relative temperature rises observed for various stocks.

Another type of non-resonance hysteresis testing device is the compressed rolling ball tester (30). It consists of two parallel circular iron plates the upper one driven and the lower one stationary and having a V-shaped groove in which a 1.23-inch diameter solid rubber ball is rolled against the upper plate. The upper plate may be loaded or clamped to give a fixed deflection. The temperature of the ball is measured after a fixed time of running by means of a needle thermocouple. This apparatus appears to have good possibilities, particularly when the top plate is clamped. The difficulty of molding uniform rubber balls must be admitted and also the fact that a continuous temperature record cannot be obtained.

Another well-developed type of non-resonance forced vibrator was that described by Roelig (31) which was extensively used in the German synthetic rubber development. This device, shown in Figure 19, consists of a mass M, driven by centrifugal masses m, and forced against a rubber sample by means of a stiff compression spring to give constant static force. A mirror is actuated by point A on the mass M. Another mirror is actuated by Point B on the ring dynamometer. A beam of light is reflected from the two mirrors in such a manner that a dynamic hysteresis loop is traced on a screen. It should be noted that the force thus registered is the actual force on the rubber—not the driving force (termed F cos pt in this paper) on the system. Consequently the position of the loop is independent of the phase relation between the amplitude and the driving force. Thus the loop obtained with Roelig's apparatus is not the same as that shown in Figure 4[5], which rotates as the frequency is varied. Roelig defined the per cent damping as 100 × area of the loop/triangular area under the loop. This procedure appears to base the loss per cycle upon four times the vibrational energy in the cycle so that the damping values secured are about one-half as large as those from the rebound pendulum. Roelig's apparatus is very ingenious and is sound in principle when the damping is properly calculated. As a practical hysteresis test, however, it is somewhat cumbersome because of the necessity of measuring the area of the loop for each determination, an extremely laborious procedure.

The Goodyear flexometer is the most recently described non-resonance vibrator (32). It is shown sche-

[4] See INDIA RUBBER WORLD, Oct., 1946, p. 68.
[5] *Ibid*, p. 63.

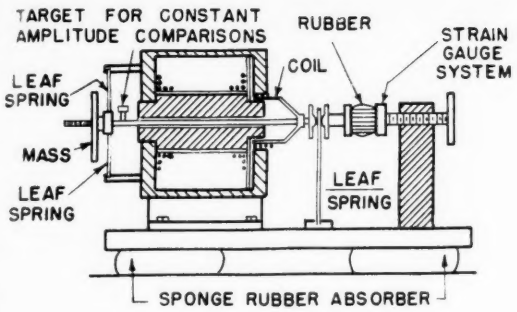


Fig. 20. Goodyear Flexometer

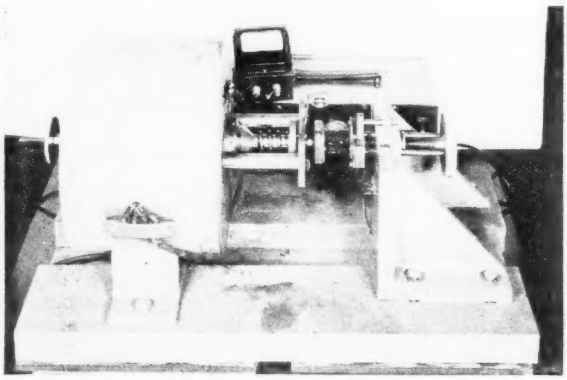


Fig. 21. Goodyear Flexometer

matically in Figure 20. A photograph of the apparatus is given in Figure 21. The rubber sample (one- by one-inch by two-inches long) is compressed to 6% between the fiber inserts of the platens by means of the adjustment screw operating against the stiff spring. Controlled 60-cycle current is supplied to the coil, which vibrates horizontally in a radial magnetic field. Since the central system of rod, coil, spring, and rubber sample is driven at 60 cycles/sec., it is advantageous to have the natural frequency of the system in the vicinity of this value. This is accomplished by adjusting the mass M. This adjustment must be made only for stocks of greatly differing modulus. The sample is enclosed in a jacket, controlled at 35° C., during the test. The temperature at its center is measured by means of a needle thermocouple at the start of the test and after running for 10 minutes at fixed amplitude. The equilibrium temperature is not quite reached in 10 minutes, but the rate of change of temperature at that time is very small so that comparison of the 10-minute temperature rise for different stocks is significant. The amplitude is determined by visual observations of an arrow-shaped mark on the moving system through a magnifying lens or by an inertia vibration pick-up. As the sample heats up, a few adjustments of the current are necessary to maintain the desired standard amplitude, but the system is stable and settles down rapidly. The temperature rise for a given stock is found to be approximately a linear function of amplitude X, indicating that the decrease of the internal friction η (see Equation 15)[6] with temperature rise compensates partially for the X^2 factor in H_x.

Recently an attachment has been devised for the Goodyear flexometer which permits its adaptation for comparing the temperature rise in stocks flexed by the same alternating force. With this device the test piece is

[5] *Ibid*, p. 64.
[6] *Ibid*, p. 68.

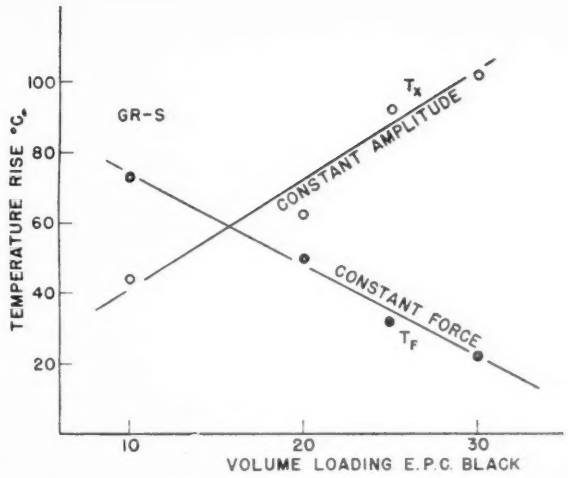


Fig. 22. Goodyear Flexometer Comparison at Constant Amplitude and Constant Force

loaded against a stiff spring which undergoes vibrations of very small amplitude. These are proportional in amplitude to the vibratory force on the rubber test piece. The vibrations of the spring are amplified by means of a resistance strain gage and electronic amplifier. A steel spiral spring inserted in place of the rubber test block and vibrated at constant amplitude serves to calibrate the output of the amplifier. When the output is held the same for a series of stocks, a constant force comparison is secured.

Figure 22 illustrates the wide deviation between the constant force and constant amplitude comparisons for a series of GR-S stocks with different black loadings.

The Goodyear flexometer appears to furnish a straightforward method of measuring the hysteresis loss, either at constant amplitude or constant force, as demanded by the projected type of service for the stock tested. The measurement of "temperature rise" under properly controlled conditions removes much of the uncertainly caused by the temperature coefficients of η and G, when measured in a resonance-type forced vibrator with the object of calculating H_x and H_f. However it is to be noted in Figures 13[5] and 26 that the temperature coefficients of η and G become rather small above 100° C., and, hence, if resonance comparisons are made of H_x and H_f within the range of operating temperatures, relative hysteresis figures are quite reliable. The somewhat undesirable characteristics of a compression vibration (shape factor and inability to obtain a continuous temperature record) are minimized in the Goodyear flexometer by the use of a long and narrow sample.

Comparison of Results of Various Hysteresis Tests

It is hardly necessary to present data on static loop hysteresis measurements since this type of test has been found unsatisfactory and is now seldom used. However representative compression hysteresis loops are shown in Figure 23. Since hysteresis is inherently a "time effect," it is obvious that a static measurement of it has little significance. Suffice it to quote an extreme case in the experience of one of the authors (33) where a stock (30 volumes black) based on an early Butyl-type polymer gave only 11% hysteresis in an "equilibrium loading" loop, compared to 17% for a control stock based on natural rubber. A rebound test showed only 7% rebound, as compared to 42% for the natural rubber stock. These tests were made at room temperature. While this case is extreme and seldom experienced with

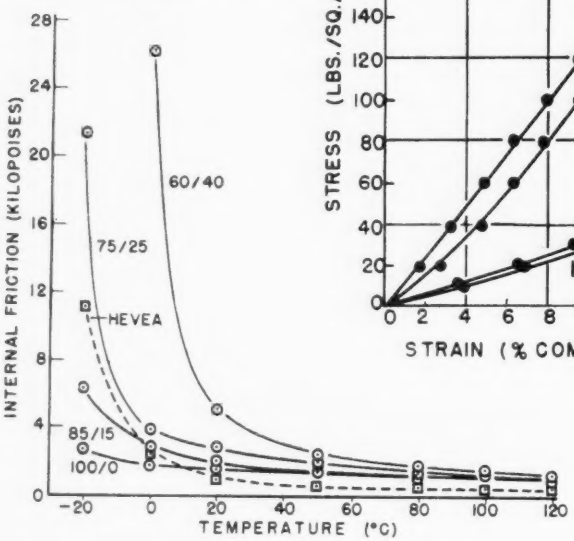


Fig. 24. Butadiene - Styrene Ratio Comparison: Internal Friction vs. Temperature: Gum Stocks (Firestone Resonance Vibrator)

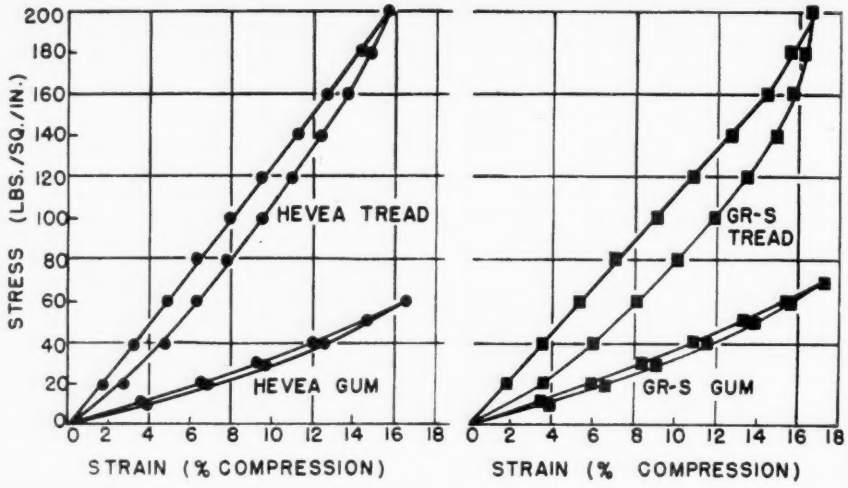


Fig. 23. Compression Stress-Strain Static Hysteresis Loops

other types of polymer, it indicates that the static stress-strain hysteresis loop can hardly be considered a dependable measure of the hysteresis defect.

A rather interesting comparison of ball rebound resilience and internal friction obtained by the forced vibration method is given in Table 2. A very good correlation is shown for rebound and friction in comparing GR-S against *Hevea* in either gum or tread stocks. If attention is confined to a given stock, the temperature dependences of rebound and friction appear to be similar. However, if we compare the GR-S gum stock against the *Hevea* tread stock, we find that they give equal rebound at 120° C.; whereas they differ greatly in the friction. This is an excellent example of the known dependence of rebound resilience upon modulus. Another interesting example of the relation between rebound and friction is shown in Table 3, where increasing amounts of styrene, for ratios 85/15, 75/25, 60/40, in the GR-S polymer result in a large decrease in rebound in tread stocks at 100° C., but cause no appreciable change in the friction. At 40° C., the friction increases with increasing styrene content, in agreement with the decreasing rebound.

A comparison of various hysteresis indices obtained by free vibration, forced vibration, and rebound methods is given in Table 4. The free vibration apparatus used was similar to that of Mooney and Gerke (34) except that molded cylindrical samples were employed and the torsion pendulum was pivoted on a needle point to allow measurements with no tension in the samples. While poor agreement was found for absolute values of $p\eta$ obtained by the various methods, the relative values for different stocks do not vary greatly. Undoubtedly the use of a more precise free vibration method would give better agreement in the absolute values of $p\eta$.

TABLE 2. REBOUND VS. INTERNAL FRICTION

	Tests at 20° C.			Tests at 120° C.		
Stock Type	Dynamic Modulus (G)	Friction (η)	Rebound (%)	Dynamic Modulus (G)	Friction (η)	Rebound (%)
Hevea gum	3.0	0.80	69	3.2	0.30	87
Tread	27.0	9.5	44	17.0	2.70	72
GR-S gum	4.8	2.80	57	4.0	1.00	73
Tread	60.00	30.00	37	17.0	6.8	50

NOTE: η Measured in Firestone shear vibrator @ 60 cycles/sec.; units: kilopoises.
G Measured in Firestone shear vibrator @ 60 cycles/sec.; units; megadynes/cm.²
% Rebound measured with falling ball (1.9 cm. diam.) from one-meter height.

TABLE 3. REBOUND, INTERNAL FRICTION, AND DYNAMIC MODULUS

(Tread Stocks at 100° C.)

Butadiene/Styrene	Dynamic Modulus (G)	Friction (η)	Rebound (%)
100/0	26.5	7.8	62
85/15	21.1	7.9	72
75/25	17.4	7.7	47
60/40	14.1	7.9	42

Typical Results of Hysteresis Measurements on GR-S Type Polymers

The effects of varying the butadiene/styrene ratio are quite definite. It is observed in Figures 24 and 25 that increasing the styrene content of the polymer increases the friction. However the differences in η tend to

TABLE 4. VALUES OF $p\eta$ FOR FORCED VIBRATION, FREE VIBRATION, AND REBOUND

	Tests at 50° C.					Tests at 100° C.				
	G x 10^6		Values of $p\eta$ x 10^6			G x 10^6		Values of $p\eta$ x 10^6		
Stocks	Forced Vibration	Free Vibration	Forced Vibration	Free Vibration	Rebound	Forced Vibration	Free Vibration	Forced Vibration	Free Vibration	Rebound
Hevea gum	3.0	3.8	0.20	2.08	0.565	3.1	4.7	0.13	2.52	0.415
Tread	19.5	28.4	3.81	24.2	6.9	16.1	19.0	1.00	9.40	5.4
GR-S gum	4.6	4.4	0.76	2.58	1.9	3.9	6.0	0.43	3.77	1.28
Tread	41.2	27.0	6.55	21.8	28.0	18.3	18.8	3.20	12.9	13.1

NOTE: Forced vibrator tests at 60 cycles/sec.
Free vibration tests—torsion pendulum: freq. range—0.02 to 0.07 cycles/sec.
Ball rebound tests: $p\eta = \frac{3G}{\pi}\frac{\ln 100}{R}$; Forced vibration values of G used in calculation.

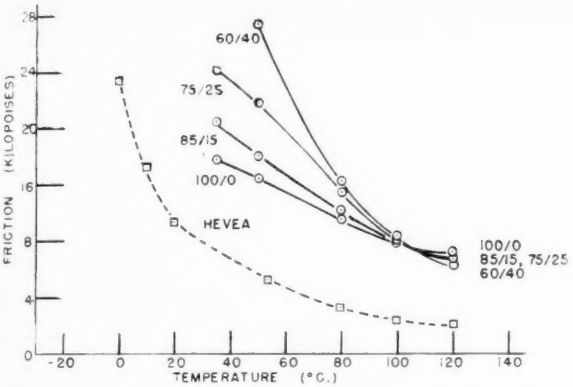


Fig. 25. Butadiene-Styrene Ratio Comparison: Internal Friction *vs.* Temperature: Tread Stocks (Firestone Resonance Vibrator)

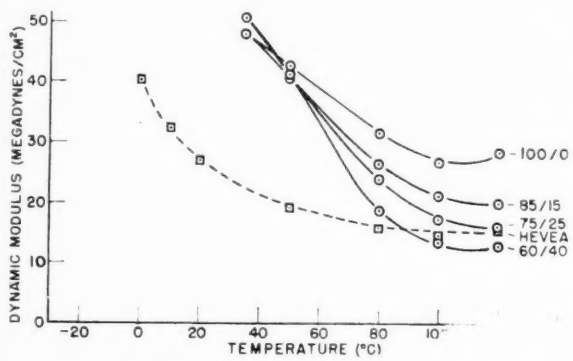


Fig. 27. Butadiene-Styrene Ratio Comparison: Dynamic Modulus *vs.* Temperature: Tread Stocks (Firestone Resonance Vibrator)

TABLE 5. EFFECTS OF HYDROCARBON CONVERSION

GR-S in Gum Stocks
Tests at 60 Cycles/Sec.

Conversion %	Dynamic Modulus (Megadynes/Cm²) @20° C.	Dynamic Modulus (Megadynes/Cm²) @80° C.	Internal Friction (Kilopoises) @20° C.	Internal Friction (Kilopoises) @80° C.	Rebound % @20° C.	Rebound % @80° C.
56	5.2	2.8	3.1	1.9	54.	50.
80	6.0	4.3	2.8	1.5	57.	67.
90	5.7	4.6	2.0	1.4	65.5	74.

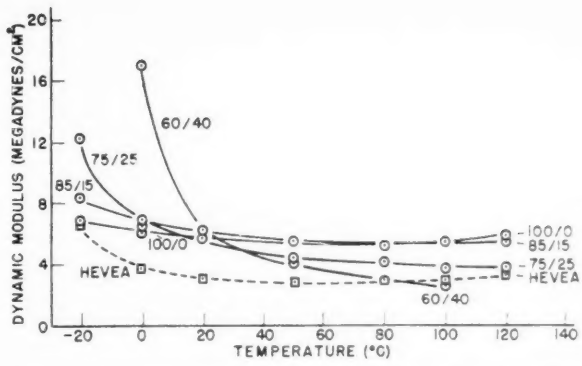


Fig. 26. Butadiene-Styrene Ratio Comparison: Dynamic Modulus *vs.* Temperature: Gum Stocks (Firestone Resonance Vibrator)

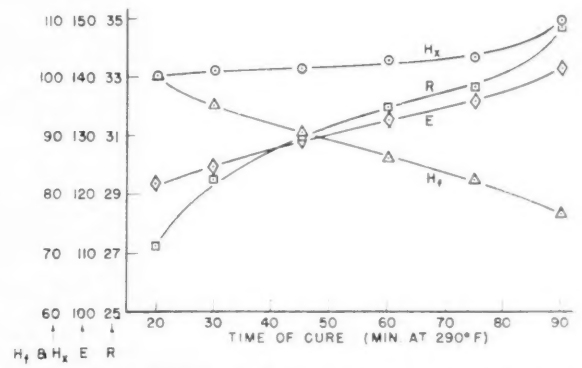


Fig. 28. Effect of Cure on Dynamic Properties: Tread Stock at Room Temperature (Goodyear Forced Vibrator)

TABLE 6. COMPOUND FORMULAE
(These Apply to Firestone Tests Only)

	Hevea Gum	*Hevea* Tread	GR-S Gum	GR-S Tread
Rubber	100	100	100	100
Sulfur	3.0	3.0	2.0	2.0
Zinc oxide	3.0	3.0	5.0	5.0
Stearic acid	0.5	3.5	0.5	3.0
Captax	1.0	1.0	1.5	1.5
AgeRite Powder	1.0	1.0		
Pine tar		3.0		
Bardol				5.0
Channel black		50.0		50.0
Cure—Min. 270° F.	75	75	100	125

diminish at high temperatures; while, as shown for tread stocks in Figure 27, the spread in dynamic modulus increases. This behavior is in accord with current theories of the structure of high polymers, increased branching (with decreased styrene) resulting in lower internal friction and a higher modulus. The increase in the temperature coefficients with increased styrene is, perhaps, not quite so easily explained. The same tendency is shown in Table 5, where the dynamic properties for three states of conversion of GR-S in gum stocks are given.

The dependence of dynamic properties upon state of cure for a typical GR-S tread compound is shown in Figure 28. Formulae of the compounds used in the Firestone tests are given in Table 6.

Suggestions on Methods of Evaluation of Experimental Polymers

The foregoing analysis yields the following suggestions on hysteresis evalution of experimental polymers:

1. Disregard results of static hysteresis loop measurements.

2. Question all impact resilience results where modulus or hardness varies appreciably.

3. Avoid the use of free vibration measurements.

4. Make measurements at both room and elevated temperatures.

5. Make comparisons at the same frequency if possible (20 cycles/sec., or higher).

6. Employ either constant amplitude or constant force indices, as demanded by the service application.

7. Internal friction or temperature rise under constant amplitude conditions appears to be the most reliable indices of the hysteresis defect, from a fundamental viewpoint.

8. It is desirable to make hysteresis measurements on both a gum stock and a tread stock of each polymer.

To recapitulate, the importance of laboratory hysteresis tests for synthetic rubber is twofold. In the first place, if properly carried out and interpreted, such tests enable a prediction of heat generation and relative serv-

ice temperatures in various applications. In the second place, the tests furnish, in a general way, a criterion of the rubber-like quality of the polymer, its ability to deform and recover under the action of rapidly applied forces. The various deteriorating chemical reactions which comprise the aging of rubber all have positive temperature coefficients. When operating conditions are severe enough to cause appreciable temperature rise due to hysteresis, it seems obvious that the service life will be adversely affected by the higher temperatures, not only because of accelerated aging, but also because of reduced hot tear and tensile values.

It seems well to consider briefly the desired characteristics of a dynamic test (or, in fact, any test) balanced against what we can expect actually to obtain. The natural question is often asked:

"What is the *true* index of dynamic quality in a polymer?"

It should be emphasized that *there is not and never will be a unique answer to this question.* The polymerization chemist and compounder must recognize this fundamental fact if they ever expect to achieve an unambiguous concept of dynamic quality and clarify the objects of new polymer development. The reasons for this rather complicated state of affairs are readily apparent. In the first place there are several dynamic properties, and these properties are not simply dependent. It is not possible to choose any one of these properties (resilience, internal friction, hysteresis at constant force, dynamic modulus, etc.) as the quality index. Various rubber products operate under widely different conditions of strain, rate of strain, stress, rate of stress, and temperature. Furthermore different conditions are not too clearly defined at the present time. It is apparent, therefore, that there are as many quality indices as there are sets of product service conditions. Thus, instead of struggling to develop a universal ideal polymer, several polymers (appropriately compounded) should be developed along the lines suggested for their respective intended applications.

Acceptance of these facts should preclude toying with arbitrarily devised composite indices. The temptation, however, to combine several important physical properties into a "universal quality index" is strong, and a word of warning may not be out of place. Such a composite index can never have more than limited empirical success for the same reasons that no simple dynamic property can ever be expected to serve as a guide for polymer development or compounding for more than one set of service conditions.

Acknowledgment

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Simple Cold Test

(*Continued from page* 215)

The modified instrument is shown in Figure 2. The tank (not shown) is made of galvanized sheet iron insulated with rock wool and is contained in a wooden frame. The presser foot and indentor point extend into the methanol to a distance of about two inches. This is sufficient to maintain the indentor point and that portion of the presser foot which contacts the sample at the proper temperature.

Test Results

In Figure 3 is presented graphically a set of Shore durometer creep data for four polymers, (1) a tripolymer of butadiene, styrene, and acrylonitrile, (2) a tripolymer of butadiene, styrene, and methacrylonitrile, (3) a copolymer of butadiene and acrylonitrile, (4) a copolymer of butadiene and methacrylonitrile. The corresponding monomer ratios are given. Each polymer was compounded with 50 parts of EPC black. It has been the practice to select as the "freeze point" the first point on the rapidly falling portion of the curve. Two independent observers may choose, from the same set of data, freeze points which differ by 5° and, in some instances, 10° F. More often they will choose the same point. The freeze points selected from the four curves illustrated are indicated by arrows on the figure.

Table 1 gives typical Shore and A.S.T.M. creep values for GR-I, GR-S, and natural rubber, each compounded with 50 parts of EPC black. The freeze points can often be determined without constructing the curve, as was done in this case.

TABLE I. CREEP VALUES

	Shore Durometer			A.S.T.M. Tester		
Temp., ° F.	GR-I	GR-S	Natural Rubber	GR-I	GR-S	Natural Rubber
60	2.5	2.5	2	8	5	4.0
40	2	3.5	1.5	7.2	3.7	4.4
20	3.5	3	2	8.2	4.8	4.0
0	5	4	1.5	7.8	5.2	3.4
—5	5.5	4.5	2.5	9.8	3.5	3.9
—10	7	3.5	1.5	8	4.5	3.4
—15	6.5	2.5	2	9.2	4.5	3.5
—20	7.5	4	3	8.2	4.3	3.2
—25	7	4	3	9.2	4.2	4.8
—30	8	3	2.5	9.7	4.0	4.0
—35	6	3	3.5	6.6	3.9	4.5
—40	5	3	4	6.5	3.8	4.9
—45	4	3	3.5	5.4	3.5	3.8
—50	4	1.5	3.5	4.1	2.5	3.5
—55	3	0.5	3.5	3.1	1.8	3.7
—60	1	0	2	2.7	0.5	3.9
—65	0.5		1	1.5	0	3.9
—70	0		0.5	1		0.3
—75			0	0.4		0.4
Freeze Pt., ° F.	—35	—50	—60	—35	—50	—70

"Dag Colloidal Graphite." Acheson Colloids Corp., Port Huron, Mich. 16 pages. This technical bulletin covers the use of colloidal graphite in lubrication, parting, surface coating, impregnation, and others. Properties and specifications of dispersions of graphite are given, together with illustrations of applications and information on the company's technical services and literature.

EDITORIALS

Wanted—A National Rubber Policy—Soon!

THE unexpected and sudden increase in the availability of natural rubber from the Far East which has developed during the last few months has strongly emphasized the urgent need of a national policy on rubber now. International allocation of rubber will be discontinued on December 31, 1946, and this action may do much to narrow the difference between the world price of natural rubber (uncontrolled) and the world price of synthetic rubber (controlled), to the point where the use of GR-S by American industry may call for some means of government support sooner than anticipated.

There is agreement on the point that the production and use of a national security minimum of about 250,000 tons of GR-S a year is necessary as the Number One objective of any national policy on rubber, but, strange as it may seem, the biggest handicap to GR-S in its competition with natural rubber *for this use,* is continued government control. This difficulty exists not only with regard to the production and price of GR-S, but also where the important problem of future research and development on synthetic rubber is concerned.

The work of the Office of Rubber Reserve of the Reconstruction Finance Corp. and the Rubber Bureau of the War Production Board in providing for the production and use of synthetic rubber during the war years has been outstanding, but it is now necessary for private industry to take over the production, development and use of synthetic rubber if we are to realize the maximum progress in this field in this country. Apparently majority opinion in the rubber industry at the present time is in favor of retention by the government of the ownership and control of the production of synthetic rubber plants, at least until the world supply-demand and price picture on natural rubber is more stabilized. Some of the reasons for this position of the industry have been indicated as: the high capital expenditure and uncertainty of return involved in the purchase of the government synthetic rubber plants, the retarding effect of the Cross-Licensing Agreements on private research and development, and the fear that the plants will soon be outmoded and their product unable to compete satisfactorily with natural rubber if the price for this rubber drops below 12 or 15¢ a pound within the next year or two.

These factors might be removed as objections of private industry if the government logically decided that the synthetic rubber plants must be priced low to attract buyers and the difference written off as the cost of war, if the Cross-Licensing Agreements were terminated as soon as possible, and, if, as a part of our national security policy on rubber, the government agreed to keep a floor under the selling price of general-purpose synthetic rubber. The floor should be capable of movement and not fixed and should only require payment by the government to private producers when and if the price of natural rubber forced the price of synthetic rubber below a level which would return a reasonable profit to *the most efficient producer* in private industry. As mentioned in these columns last month, a similar procedure might have to be worked out for the producers of reclaimed rubber in order that their product would not be unduly discriminated against.

By agreeing to the maintenance of a floor under the selling price of synthetic rubber, the government could be relieved of its responsibility for the ownership and the control of operation of the synthetic rubber plants. By retaining only that part of the control of product specifications and allocation of synthetic rubber involved in the manufacture of rubber goods for the Armed Services and other peacetime government agencies, the production and use of a national security minimum of synthetic rubber should also be assured. At the same time the advantages of private ownership, operation, and research in synthetic rubber could be gained for the whole country.

Product specifications and allocation controls, such as are provided in CPA Order R-1, under which the rubber program has been operated by the government, should not be continued after March 31, 1947. Just as soon as the supply-demand position on natural rubber is in balance, there is no excuse for continued government product specification and allocation control of rubber for *civilian* products, other than for the purpose of encouraging more or less permanent nationalization of the rubber industry in this country. It is difficult to believe that the majority of the industry is really in favor of such a policy.

Federal specifications for rubber products for the Armed Services is a procedure that has been in operation for a long time, and the purchase of these products for use of our Armed Services even under the conditions of peacetime operations should provide a large enough demand to satisfy the national security minimum of the Inter-Agency Policy Committee recommendations. If this demand is not large enough and if the voluntary use by private industry of synthetic rubber for civilian goods is not enough to make up the difference, then, and only then, should government product specifications for civilian products be required in enough cases to provide for the use of 250,000 tons of synthetic rubber a year.

However, over and above all other considerations, the most important problem before the country at the present time is to provide suitable legislation to instrument a national rubber policy so that the uncertainty and indecision on matters of vital significance to the future of the country and its rubber industry will be eliminated. Such legislation should be one of the very first acts of the new Congress when it convenes in January, 1947. It is the duty of the rubber industry to see that legislation of the proper type is enacted promptly in order that the best interests of the country and the industry may be guaranteed.

Scientific and Technical Activities

New York Group Meeting on Processing

THE first fall meeting of the New York Rubber Group, held October 18 at the Hotel McAlpin, New York, N. Y., was featured by a panel discussion of "The Processing of Natural and Synthetic Rubber." Judging by the large attendance of more than 400 members and guests present at the afternoon session and the sustained interest of the audience throughout the program, this type of meeting is apparently viewed with considerable favor by the membership. Chairman George J. Wyrough, of Whitehead Bros. Rubber Co., presided over the panel discussion and the dinner and entertainment program in the evening. In the course of his remarks he attributed much of the success of the panel discussion program to Vice Chairman Simon Collier and his program committee.

The processing discussion was arranged so that mixing, calendering, and extrusion were each treated more or less separately by a panel of experts, headed by a leader who first presented a short paper on his particular subject. Questions submitted before the meeting by members of the Group were then answered by individual experts, either singly or in some cases by two or more members of a given panel.

The Panel on Mixing

The first panel on mixing consisted of D. A. Combes, Farrel-Birmingham Co., as leader, assisted by F. B. Dahlinger, Raybestos-Manhattan, Inc.; E. N. Cunningham, Stanco Distributors, Inc.; J. A. Scellen, Pequanoc Rubber Co.; Geo. D. Kratz, Norwalk Tire & Rubber Co.

Mr. Combes first delivered a short talk on mixing practices in general, in which he pointed out the advantage of a stiff mix for good dispersion of fillers and recommended the addition of liquid or semi-liquid ingredients as late as possible in the mixing cycle. He emphasized the necessity of maintaining the minimum specified clearance between the rotors and the housing of internal mixing machines in order to realize maximum shearing action on the rubber. He also spent considerable time explaining "upside down" mixing, that is, the practice by which the powders are first dumped into the Banbury and then followed by the rubber and oils. He stated that the method might be good in theory, but in his opinion it was not so good in practice. The extremely heavy load placed on the mixing machine, when the rubber was added, was a distinct disadvantage, he said.

Questions answered by this panel covered a comparison of Banbury mixing of natural rubber and GR-S, the reliability of the Mooney scorch test as a measure of the processing characteristics of a given stock, "upside down" mixing, a request for 40 or 50 durometer carbon black GR-S and GR-M recipes and instructions for mixing, a request for recipes and mixing instructions for GR-I (Butyl) stocks, and the advantages of synthetic reclaims, to mention a few.

The Panel on Calendering

The second panel on calendering had G. V. Kullgren, Adamson United Co., as leader, together with O. J. Lang, Armstrong Rubber Co.; R. R. Lewis, Vulcan Proofing Co.; H. B. Morse, Endicott-Johnson Corp.; A. F. Shildhauer, Fabrikoid division, E. I. du Pont de Nemours & Co., Inc.; and W. E. Scoville, Jr., United States Rubber Co.

In his talk on calenders and calendering, Mr. Kullgren mentioned that there were more requests on order at the present time for new designs and types than ever before in the history of the manufacture of these machines. Design up to now has not been much different from that of 20 years ago. The plastics industry rather than the rubber industry has been more insistent in calling for improvements in the design of calenders, and these demands were first received three or four years ago. During the war the tire expansion program prevented much work on new types of calenders for the plastics industry, but some of these new types are just now being placed in operation. Mr. Kullgren pointed out that the plastics industry requires more refinements in calenders because calendering is a finishing operation for this industry; whereas the rubber industry has the vulcanizing process to smooth over certain imperfections when and if they develop in calendering rubber stocks. To obtain greater uniformity of gage new calenders will have larger diameter rolls, will use the newer high-yield strength metals, and will have more stable journal bearings. A considerable increase in the use of roller bearings in these machines will take place, it was added. Automatic control of temperature on the roll surfaces is still not solved and will require further development.

Questions answered by the calendering panel included, how to prevent sticking of light-colored GR-I stocks to the calender rolls, a request for a recipe and calendering instructions for a 40 or 50 durometer GR-S and GR-M carbon black stock, how to avoid blisters in calendering highly loaded stocks containing mineral fillers, how to control the shrinkage of GR-S, GR-M, and GR-I stocks of various loadings, and how to calender on rayon and cotton tire fabrics.

The Panel on Extrusion

The third and last panel on extrusion was headed by J. F. Allen, National-Erie Corp.; assisted by T. K. Cox, Western Electric Co.; J. J. Millard, U. S. Rubber, and O. J. Lang, Armstrong Rubber.

Mr. Allen, as leader of the panel, gave a brief talk on extrusion machines in which he emphasized that one of the most controversial matters in connection with the development of these machines was the design of the screws and dies used.

Questions answered by this panel dealt with the characteristics of natural *versus* GR-S rubber in extrusion work, how effective the Garvey die was for estimating tubing characteristics, whether there was any equipment available for extruding two different stocks in the same unit, and the procedure used with GR-S, GR-M, etc., in extruding c. v. wire insulation.

Group May Publish Discussion

It was announced that if sufficient interest was evidenced, the New York Group might assemble the papers given by the leaders of the three panels, the questions asked, and the answers given in the form of a booklet for distribution among its members and other interested parties. Stenographic notes were taken during the discussion for this purpose.

A.S.T.M. Activities

THE American Society for Testing Materials, Philadelphia, Pa., has announced the dates for its national meetings in 1947. The spring meeting and committee week will be held in Philadelphia, at the Benjamin Franklin Hotel February 24 through 28. The fiftieth annual meeting will take place in Atlantic City, N. J., at the Chalfonte and Haddon Hall Hotels, June 16 through 20.

The technical feature of the spring meeting is to be a symposium on testing and evaluation of paints and paint materials, under the joint sponsorship of the Society's Committee D-1 on Paint, Varnish, Lacquer and Related Products, and the A.S.T.M. Philadelphia District. During this meeting the Society expects to have dedication exercises and open house at its new headquarters on Philadelphia's Parkway.

Committees D-20 on Plastics, D-14 on Adhesives, and D-9 on Electrical Insulating Materials, held meetings in Atlantic City during the week of October 14. Committee D-9 held a symposium on insulating oil on October 16. As a part of its program, Committee D-14, on October 15, heard W. O. Baker, of Bell Telephone Laboratories, present a paper, "Cohesion, Adhesion and Structure of Polymer Molecules." Committee D-20 held its biennial dinner on October 14 at the Haddon Hall Hotel.

Committee Reports—Buffalo Meeting

Reports of some of the committees and sub-committees on actions taken or proposed at the Buffalo annual meeting in June have been received. The advisory committee of D-20 on Plastics decided to ask that the scope of D-20 be enlarged to cover plastics and their raw materials as well as finished plastics. This action was taken in view of the growing need of methods of test for specifications for plasticizers. The new sub-committee 27 of Committee D-11 on Rubber and Rubber Products decided on definitions and explanations of terms for resilience, hysteresis, dynamic modulus, and damping, subject to letter ballot in the sub-committee.

New Specifications

Of interest in connection with rubber and rubber products is the change in "Tentative Requirements for Rubber Sheath Compound, D-532," which eliminates vulcanizing in a metal mold, this part of the test being considered superfluous, provided the physical requirements properties are met. Also, the "Ozone-Resistant Type Wire Insulation Specification, D-574," will have the value of the constant K in the formula for in-

sulation resistance changed from 5280 to 2000. During the war this constant was dropped to 1000 in the emergency alternate provisions. In effect, therefore, this change increases the constant to 2000. This value is the same as now used in specifications D-754 and D-755 covering synthetic rubber insulations.

Revisions in the "Heat-Resisting Synthetic Rubber Compound Specification, D-754," will permit the use of some natural rubber when this becomes available and will include additional types of conductors with the 1/32-inch wall. In "Performance Synthetic Compound, Specification D-755," the use of natural rubber, and additional types of conductors are included, and in addition the aging requirements are made more rigorous.

"Methods of Testing Rubber Insulated Wire and Cable, Specification D-470," is to include the horizontal flame test which had appeared during the war as an emergency revision. The change in "Test for Rubber Hose, Specification D-380," will permit the use of a certified test slab from the same material as used in the hose in cases where the material is so thin that the minimum requirement of 1/32-inch of test sample cannot be made complied with.

A new alternate method which is particularly applicable to fabrics having low resistance to passage of moisture has been incorporated in the various tests for rubber-coated fabrics as established by specification D-751. This involves the Suter equipment. The adhesion test procedure is being modified so that the results should give a better average figure instead of the maximum values.

Of particular interest in identifying and analyzing synthetics is the incorporation in D-833 of spot tests, representing utilization of the results of recent work. These tests are more rapid and considered fully as reliable as those replaced.

Two new methods of testing adhesives, "Tensile Properties of Adhesives, Specification D-897," and "Resistance of Adhesive Bonds to Chemical Reagents, Specification D-896," are the first that have resulted from the work of the relatively new Committee D-14 on Adhesives. There is an intensive demand for test methods for evaluating different types of adhesives and possibly also for performance-type specifications, but the Committee has, for the past year or two, been concentrating its work on test methods.

The tensile test will determine comparative properties of adhesives, using a standard-shape specimen with specific conditions of pretreatment, temperature, and testing speed. The requirements give specific dimensions on the test specimens and their quality whether wood or metal, the gluing conditions, the number of specimens (at least 10 must be tested), and the general procedure.

The new test for resistance of adhesive bonds to chemical reagents requires the use of the other new test for tensile properties, D-897. The testing procedure requires that each specimen shall be in a separate container, totally immersed in the reagent for seven days at a temperature between 25 and 30° C., and the reagent is to be stirred every 24 hours. After being rinsed with distilled water and dried, the specimen is tested immediately. Various standard chemicals are listed for use, including sulfuric acid of various strengths, sodium hydroxide solutions, various alcohols, and others.

Copies of all of the new and revised A.S.T.M. specifications will be available during the fall from A.S.T.M. headquarters, 1916 Race St., Philadelphia 3, Pa., at 25¢ each. They are also being included in the new "1946 Book of A.S.T.M. Standards" to be issued in December—February, in five parts.

Rubber Division to Meet in Cleveland

ALTHOUGH complete details are not yet available, it is understood that the Division of Rubber Chemistry of the American Chemical Society is planning to hold its 1947 spring meeting separate from the parent Society. The one hundred and eleventh meeting of the A. C. S. is scheduled for Atlantic City, April 14, through 18. The Division of Rubber Chemistry plans to hold its meeting in Cleveland, O., during the week beginning May 26, 1947.

As soon as further information regarding the headquarters hotel, local committee in charge of arrangements, and program details are received, they will be published.

Ladd Speaks on Electron Microscope Studies

ENDING a three-month summer recess, the Los Angeles Rubber Group, Inc., met October 1 in the Mayfair Hotel, Los Angeles, Calif., with officials of the Goodyear Tire & Rubber Co. as hosts. Speakers at the meeting were W. A. Ladd, physicist in charge of electron microscopy at the Columbian Carbon Co.'s research laboratories in New York, and Arthur C. Horrocks, chief counsel of Goodyear's public relations department. C. Miles Reinke, chairman of the Group, presided over the dinner-meeting, which was attended by 200 members.

"Colloidal Carbon-Rubber Investigations with the Electron Microscope" was the title of the talk presented by Mr. Ladd before the technical meeting, using both slides and color motion pictures as illustrations. He showed films obtained through stereo-photomicrography of carbon specimens prepared by various techniques, such as sparking, mulling, and vulcanizing. The speaker related that in March, 1944, electron stereo-photomicrography revealed the reticular nature of carbon structure in rubber, showing that many carbon chains or fibers are present in addition to deflocculated particles. Further study revealed another feature, namely, a carbon rod linkage for Thermax, P-33, lamp black, acetylene black, Micronex, and Superspectra when dispersed by a high-frequency discharge.

The speaker also discussed and illustrated the high-speed microtome, developed by him to make possible the preparation of specimens thin enough to be penetrated by the electron beam. At its present stage of development, Mr. Ladd stated, the high-speed microtome has successfully sliced carbon-rubber sections down to the order of a millionth of an inch in thickness. This was accomplished with a centrifuge of 5,000 r.p.m. and a head of 14 inches diameter, with a knife circle diameter of 15½ inches giving a maximum cutting speed of 230 m.p.h.

W. J. Thomas, of the Los Angeles district office of Firestone Tire & Rubber Co., presided over the technical session. After dinner, Mr. Horrocks spoke on "America at Flood Tide," in which he envisioned the greatest era of technical and industrial progress in history for the immediate years ahead.

New Elastomers Discussed

"NEW Types of Elastomers" was the title of a talk given by Thomas Davies, manager of development, Polymer Corp., Ltd., Sarnia, Ont., before 62 members of the Ontario Rubber Section, C.I.C., at a dinner-meeting held October 15 at Hart House, University of Toronto. The speaker discussed the various numbered GR-S types and X polymers and the various uses to which they are put, including tread stocks, adhesives, mechanical, electrical, and non-discoloring types, etc. The requirements of general-purpose and high solids latices were also taken up, together with progress being made on fulfilling these requirements, with special reference given to Type 3, and X-288 latices. Mr. Davies stated that they were currently reviewing information on Buna S-3 type of polymers produced in American pilot plants. He also presented data on road tests carried out several months ago on GR-S *versus* Buna S-3. Reference was also made to the Redox systems, on which work has been started on a pilot-plant scale. In connection with the talk by Mr. Davies, a short motion picture film, "R for Rubber," was also shown.

1945 Rubber Chemicals Output

IN 1945 production of all rubber processing chemicals totaled 100,953,000 pounds, according to a report from the United States Tariff Commission, an increase of 8,000,000 pounds compared with 1944. Sales amounted to 91,156,000 pounds, valued at $43,953,000. Cyclic rubber chemicals output totaled 80,080,000 pounds, of which 39,970,000 were accelerators, and the remainder were antioxidants. Among the cyclic accelerators, production totals (in pounds) were as follows: aldehyde-amines, 940,000; dithiocarbamates, 407,000; guanidines, 3,833,000; and thiazole derivatives, 34,279,000. Production of acyclic chemicals totaled 20,873,000 pounds. Total acyclic accelerator production was 7,533,000 pounds, of which 731,000 were dithiocarbamates and 5,260,000 were thiurams.

Production of surface-active agents in 1945 amounted to 162,000,000 pounds, an increase of 5.8% over 1944. Sales were 135,000,000 pounds, value $38,000,000. Production of plasticizers in 1945 dropped to 169,000,000 pounds, 9% under 1944 figures, and sales of 139,000,000 pounds were valued at $34,000,000. Production of cyclic plasticizers, which include phthalates, decreased 13%. The output of dimethyl phthalate was 19,000,000 pounds, less than half that of 1944. Production of tricresyl phosphate dropped from 21,000,000 pounds in 1944 to 14,000,000 in 1945. Thirty million pounds of acyclic plasticizers, which include dibutyl sebacate, were produced in 1945, or 14% more than in 1944.

Tobolsky at Detroit Meeting

THE fall meeting of the Detroit Rubber & Plastics Group, Inc., was held October 18 in the Detroit Leland Hotel, Detroit, Mich., with approximately 135 members and guests attending. Speaker of the evening was Arthur V. Tobolsky, professor of chemistry, Princeton University, whose topic was "Physical Properties and Molecular Structure of Natural and Synthetic Rubbers." The lecture was accompanied by illustrated slides and provoked a lively discussion upon completion.

The methods of continuous and intermittent relaxation of stress at constant extension provide a means of following the structural-chemical changes that occur in rubber networks at elevated temperatures, stated Dr. Tobolsky. These changes include chain scission and chain cross-linking induced by molecular oxygen, as well as bond interchange, hydrolysis and depolymerization. Among the rubbers studied were natural rubber, the Bunas, Butyl, neoprene, Lactoprene, polyesters, polysulfides and silicones. As expected, these rubbers show a tremendous variation in relaxation characteristics which can be correlated with their chemical structures. A theory of permanent set at elevated temperatures which gives satisfactory agreement with experimental results has been developed in terms of the concepts of scission and cross-linking. At sufficiently low temperatures, said the speaker, stress relaxation provides a means of measuring the stability of secondary forces between the network chains and comparing the cold-resistance of various rubbers. Interesting effects occur in rubbers which crystallize at low temperatures. At intermediate temperatures, stress relaxation provides a means of following the extent of vulcanization and also provides a means of distinguishing between cross-linked and non-cross-linked polymers.

The December meeting of the group will be a Christmas party, to be held December 13 at the Detroit Leland Hotel. The speaker of the evening will be announced at a later date.

Chicago Group Meeting

THE Chicago Rubber Group is meeting November 1 at the Morrison Hotel, Chicago, Ill. Joe Brady, of Naugatuck Chemical Division, United States Rubber Co., is to speak on "Present and Future Synthetic Rubber Polymers" and to discuss the relation of the various types of synthetic rubber polymers to the use of natural rubber in the future. H. A. Winkelmann, of the Dryden Rubber Co., has as his subject "The History of the Rubber Industry in Chicago," reviewing the early days of rubber manufacture in the Midwest and the development of the industry to its present state. Dr. Winkelmann's talk is similar to the paper he presented before the Division of the History of Rubber Chemistry, A. C. S., in September.

Tentative plans have been made by the Group for its Ladies' Night Christmas Party to be held December 20 at the Terrace Casino of the Morrison Hotel. The program will include dinner, dancing, entertainment, and prizes for the ladies. Frank Taylor, of Commercial Solvents Corp., is chairman of the program committee for this meeting.

Boston Group Hears Holt

A TOTAL of 336, including 51 guests, attended a dinner-meeting of the Boston Rubber Group on October 4, at the Copley Plaza Hotel, Boston, Mass. Speakers at the technical session were Everett G. Holt, rubber adviser, Industry Division, Office of Domestic Commerce of the United States Department of Commerce, who spoke on "Types and Qualities of Natural Rubber to Be Expected in 1947," and Earle Smith, technical consultant of Dow Corning Corp., whose topic was "Properties and Uses for Silastic, the New, Heat Stable Silicone Elastomer." Mr. Holt's paper appears on pages 205-208 of this issue; while Mr. Smith's paper was similar to that by P. C. Servais, which appeared in our August issue, page 657.

The next meeting of the Group will be at the Copley Plaza Hotel on December 6. In addition to annual elections and a business session, the meeting will also include the Group's Christmas party. Speakers for this meeting will be announced at a later date.

Philadelphia Group Outing

THE Philadelphia Rubber Group held its annual outing on September 20 at the Oak Terrace Country Club, Ambler, Pa. About 50 members, of the 115 attending, took advantage of the fine golf course and entered the golfing contests. For non-golfers field events were available, including bocci and swimming. The outing was topped off with a fine steak dinner and an evening of good fellowship.

Close to 100 awards were made in the form of contest and door prizes. In the golfing contests, the prize for low gross, a dozen golf balls, was won by W. R. Cleary, of the Barrett Co. High gross, likewise a dozen golf balls, went to R. B. Davis, of MacEwan & Smith. In the kickers' handicap, first prize, a set of irons, went to A. J. Hawkins of E. I. du Pont de Nemours & Co., Inc.; second prize, a set of woods, was won by Arther Nellen, Lee Rubber Tire & Corp.; and third prize, a golf bag, was awarded to Guy Lucian, also of Lee.

New Navy Specifications

THREE new navy specification titles appearing since our previous listing in the October issue are given below, in accordance with India RUBBER WORLD's policy to keep the rubber industry currently advised of changes in, or additions to pertinent Navy Department and related specifications. Those members of the industry desiring copies of these specifications can obtain them upon request, giving title, number, and date, from the Navy Department, Bureau of Supplies and Accounts, Washington 25, D. C.

The new specifications are as follows:

Navy Dept. Spec. 33H4H—Hose, Oil-and-Gasoline-Suction-and-Discharge, Synthetic Rubber, Wire-Stiffened, dated 3 September 1946.

Navy Dept. Spec. 52C40—Compound, Calking, Synthetic-Rubber-Base (for Seams of Wooden Decks), dated 16 September 1946.

Joint Army-Navy Spec. JAN-P-358—Protectors (Plugs), Ear, Synthetic Rubber; and Containers, dated 25 June 1946.

Connecticut Group Outing

THE Connecticut Rubber Group held its first annual outing on September 21 at the Meadowbrook Country Club, Hamden, Conn. Despite inclement weather, about 115 members enjoyed the full afternoon of sports, including golf, softball, darts, ring toss, tenpins, baseball pitching, horseshoes, badminton, and bocci. This program was followed by a cocktail hour and climaxed by a lobster dinner during which awards were given to contest winners.

In the golfing contests, conducted by George Sprague, first, second, and third prizes for low gross went to Fred Salamon, A. Murdock, and V. N. Hastings respectively. High gross was taken by B. Fairbanks and R. Rooney; while low net was won by M. T. Hedges. The prize for high blind hole went to Al Mazur, and the awards for low blind hole were won by Thomas Skipp, William Fairclough, F. F. Salamon, Fred Salamon, and G. J. Schwenk. In the kickers' handicap, prizes were awarded to Thomas Skipp, William Fairclough, T. W. Hungerford, Frank Harris, F. F. Salamon, and Ed Owens.

Prizes in the softball tournament conducted by George D'Olier went to the New Haven-Bridgeport team, whose members were C. A. Larson, V. Chadwick, W. S. Gocher, W. F. Kelly, A. J. Jennings, L. L. Wooster, R. H. Dudley, R. Bierman, A. E. Bald, and G. W. Goodson. Consolation prizes were also awarded to the members of the losing softball team, the Naugatuck Valley-Peddlers. Thomas Skipp and Ernest Owens won the awards in both the bocci tournament conducted by Guy Di Norscia and the horseshoe pitching contest conducted by Ray Dudley. In the midway contests, conducted by Don Spengler and Milt Greenhalgh, the prize for ring toss went to W. J. O'Brien, Jr.; D. R. Welter, A. E. Bald, and V. N. Hastings took first, second, and third prizes, respectively, in the ball roll contest; Ernest Owens won first prize in darts, with second prize to I. Monroe, and third place was shared by C. A. Meyer, E. Landkowski, G. Stahlschmidt, L. L. Longworth, and C. E. Blake; and prizes in the marble game went to V. N. Hastings, R. E. Blake, and H. K. Encke. Besides contest awards a large group of door prizes was distributed during dinner courses, through the courtesy of 98 contributing companies. Ralph B. Norton acted as chairman of the Group's outing committee and was assisted by Roger C. Bascom and Edmund J. Butler.

New Neoprene Cement

A NEW synthetic, waterproof adhesive said to be more resistant to oxidation than corresponding natural rubber cements was announced by the fabrics division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. The new cement is recommended for bonding nitrile-type rubbers and vinyl film or sheet stocks to rigid surfaces such as steel, aluminum, glass, wood, or concrete.

Designated as No. 5118 "Fairprene" adhesive cement, the new material does not require vulcanization to obtain maximum adhesive strength. Oils or straight gasoline will weaken the bond strength only slightly, although aromatic hydrocarbons will destroy the bond. Unaffected by

temperatures as low as 40° F., the cement's adhesive strength is weakened at temperatures of 160° F. or above. Full bond strength is regained after cooling to normal temperatures. Cold setting, the new adhesive will dry to a tacky surface in three to 10 minutes, under average conditions, and dry completely in two hours.

Glycerin in Latex Threads

GLYCERIN plays a novel role in a new process for forming latex threads of filaments. As described by A. O. Ryan, in United States patent No. 2,402,846, a stream of glycerin is discharged into a relatively small tube at such a rate that it moves with a viscous flow. A relatively thin, continuous liquid stream of latex is discharged into the center of the stream of glycerin, moving at the same speed and in the same direction. The glycerin, being heated, thus serves as both the support and coagulating or hardening medium for the latex. The coagulated latex is withdrawn from the glycerin in the form of a relatively fine thread and is then cooled and washed. The glycerin flows into a sump, is pumped into a heater, and passes on to a tank, and it can be reused in the process.

Southern Ohio Group Formed

A NEW rubber group, to be known as the Southern Ohio Rubber Group, was organized at a meeting held in the Van Cleve Hotel, Dayton, O., on October 24. The meeting was attended by more than 150 people associated with the rubber industry, of which approximately 100 became charter members of the group.

The committee responsible for the meeting and organization of the group consisted of E. C. Dill, R. R. Hickernell, J. E. Feldman, and H. E. Wening, all of the Inland Mfg. Division, General Motors Corp. Mr. Dill acted as toastmaster and introduced Mr. Feldman, who explained the aims of the group. Membership is to be drawn from southern Ohio, Indiana, Kentucky and Tennessee. During the organization meeting a committee was named to nominate officers, who will be elected by letter ballot. Mr. Dill, named chairman of the nominating committee, will be assisted by B. Adinoff, W. T. Reed, George E. Lang, and Carl Cramer. The elected officers will write a set of rules and by-laws which will be voted upon by the group at a business meeting scheduled for February, 1947. A membership committee was also chosen, which includes J. W. Whiteside, H. W. Bell, N. C. Dworack, John Walsh, A. J. Marshall V. K. Hitch, R. S. Radow, and Homer Gill.

The meeting was preceded by a dinner, during which music was provided by the Earl Holderman Trio. A short sketch, "Sophisticated Mystification," was given by Robert Lewis. A talk, "What About Rubber?" was made by Max Sauer, editor of the Leesburg, O., newspaper, and M. E. Lerner, editor of *The Rubber Age*, spoke briefly on the organization of different rubber groups. Mr. Hickernell conducted a drawing for door prizes contributed by 44 companies.

Speakers at Akron Meeting

THE November 22 meeting of the Akron Rubber Group, Mayflower Hotel, will feature: "Backrinding of Molded Products" by E. L. Stangor, and "New Outlets for Rubber through Latex" by C. J. Mighton. Both are with E. I. du Pont de Nemours & Co., Inc.

Additional Experimental GR-S and GR-S Latices

ADDITIONS to the list of experimental GR-S dry polymers and GR-S latices available for distribution to rubber goods manufacturers from the Office of Rubber Reserve, RFC, under the conditions outlined in our November, 1945, issue, page 237, have been received and are listed below:

X-Number Designation	Manufacturing Plant	Date of Authorization	Polymer Description	Special Characteristics
X-313-GR-S	Goodrich, Port Neches	.....	GR-S-10 type of polymer made with sodium sulfide shortstopper, 44-55 Mooney.	This polymer should show better processing characteristics than GR-S-10.
X-331-GR-S	Goodyear, Akron	9/10/46	Continuous GR-S with a slightly lower-than-normal soap content.	
X-332-GR-S	Goodrich, Port Neches	9/6/46	GR-S type 10 polymer made in continuous polymerization unit to 48-58 Mooney.	This polymer should show some processing improvement.
X-333-GR-S Latex	Firestone, Akron	9/23/46	Low rosin GR-S latex with a normal styrene ratio; high solids (55-60%) content.	General-purpose use.
X-338-GR-S	Goodrich, Port Neches	9/25/46	Same as X-282 except made to higher conversion and a lower monomer to water charge ratio.	For same purpose use as X-282
X-341-GR-S	Firestone, Lake Charles	9/27/46	GR-S made by charging 75 parts isoprene, 25 parts styrene using an activated recipe, 60 Mooney.	The isoprene-styrene polymer shows improved hysteresis characteristics in carcass-type stock and may have improved tack. Owing to the presence of isoprene, this polymer is similar to natural rubber in chemical and aging characteristics.

Reauthorizations have been issued for the following polymers which were previously authorized, made and in consumers' tests found advantageous:

X-141-GR-S	Firestone, Akron	9/27/46	GR-S made by charging 75 parts isoprene, 25 parts styrene using dehydrogenated rosin soap, 60-70 viscosity.	The isoprene-styrene polymer shows improved hysteresis characteristics in carcass-type stock and may have improved tack. Owing to the presence of isoprene, this polymer is similar to natural rubber in chemical and aging characteristics.
X-250-GR-S	Goodrich, Louisville	9/24/46	Regular GR-S at 45 ± 5 Mooney. Shortstopped with hydroquinone; no antioxidant.	General-purpose use.
X-274-GR-S	National Synthetic, Louisville	9/24/46	GR-S-10 shortstopped with sodium sulfide and stabilized with Stalite.	For same purpose use as GR-S-10. Produced for materials where a special non-discoloring antioxidant is required.
X-278-GR-S	U. S. Rubber, Naugatuck	9/24/46	50/50 butadiene/styrene ratio. Sodium oleate and glue emulsifiers. Shortstopped with hydroquinone, 2 parts PBNA antioxidant; alum coagulated.	Use in closure and sealant compounds.
X-315-GR-S	U. S. Rubber, Institute	9/26/46	Masterbach containing 50 parts Silene EF and 100 parts of a 40 Mooney rubber, stabilized with 1.5 EFED.	For use in industrial products and specialties where this type of polymer is desired.
X-317-GR-S	U. S. Rubber, Institute	9/26/46	GR-S-20 AC made with a non-staining shortstopping agent using 1.5 parts EFED as stabilizer.	For use in goods where a non-staining antioxidant is desired.

Plastics Technology

Review of Plastic Materials Supply Outlook [1]

F. H. Carman[2]

MAKING a review of the materials supply situation at this time places one in a very precarious position, first, because of the excellent presentation made to the S.P.I. in April of this year, and, second, because of the forecasts made at that time and in December, 1945. Perhaps it is now time to look at the record to see what has been done. A review of this nature is difficult to present in a manner that would be brief and understandable to all concerned and yet answer the important industry questions on the plastic materials . . . what is the availability for the immediate future?

Since the original forecasts already mentioned, many things have happened in the industrial economy which have changed the original plans, delayed expansion programs, and in a few cases even required complete alterations in long term constructions. As this is being prepared, labor disputes are causing acute shortages in supply of certain basic raw materials and plastics. The cumulative effects on production since August are extremely serious; even though the labor difficulties are resolved in the near future, the total production lost will not be made up for some time.

In December, 1945, the Plastic Materials Manufacturers Association, speaking for its members, announced a long-range expansion program in plastic materials manufacturing in the amount of $107 million to be completed by the middle of 1947. In April of this year a brief review of the situation by Mr. Landes[3] indicated considerable delay in completion of these programs, and it was estimated that increased costs with which everyone is familiar make this original estimate of $107 million somewhere around $125 million. Owing to strikes in other industries, progress has been disappointingly slow in many cases; costs of construction have become alarmingly high. Nothing has happened since that time to permit earlier completion of these facilities; they have been delayed further. Members report an average delay of four to six months in the original plans; some facilities due early in 1946 will not come in until late in the year, and many of the expansions which were to have been completed in 1947 will not be available until 1948.

Increase in costs of many constructions has already been mentioned; the extent over the original $107 million is not available at this time.

A number of PMMA members have announced additional expansion programs not previously included in industry estimates. These include certain new materials, additions to existing plants, and will provide further growth of plastics expanded during the war. Roughly, these new programs involve expenditures amounting to $21,850,000.

Raw Material Supplies

Strikes in the coal, steel, and chemical industry, to name only a few, have severely curtailed the supply of many basic materials for the plastics industry. Some of the present or pending shortages include:

PHENOL—In short supply prior to existing strikes and is now exceedingly tight. Even with elimination of these difficulties, it is estimated the shortage will not be entirely eliminated for six months to one year.

CRESOLS AND CRESYLIC ACIDS—Certain pricing policies on coal tar do not encourage production, and, if continued, future supplies will be even less plentiful.

PHTHALIC ANHYDRIDE—Strikes earlier in the year and others now in force affect supply of this chemical in the same manner as phenol production.

UREA AND FORMALDEHYDE — There was no surplus of these chemicals before the coal strike, which aggravated the situation. During 1947 it is anticipated the availability of urea and formaldehyde is likely to be a limiting factor in plastics production rather than supply of labor or manufacturing capacity. New production units for both these chemicals should eventually improve this situation.

GLYCERINE—There is no prospect for supplies easing up before the end of 1947 or even later. The shortage is due primarily to the international shortage of fats and oils and the absence of a normally large supply of copra from the South Pacific.

PLASTICIZERS—Severely curtailed by the aforementioned strikes. Other industries competing for chemicals used in manufacture of the better plasticizers further aggravate the situation. The shortage of good plasticizers actually prevents certain desirable uses of some plastics and diverts the material to less important products. Some manufacturers are prone to resort to inferior plasticizers which may affect the reputation of the industry. Plans are going forward to increase production of certain plasticizer chemicals by the end of 1947. Some industry members predict supplies will be even more critical during 1947 when increased resin production comes in.

BENZOL AND ALCOHOL—Important basic chemicals required by many industries. Benzol supply at the present time is not too plentiful because of lower steel mill operations; as large amounts are required for both phenol and styrene and increased amounts will be needed, it is becoming ever more important for plastics. Alcohol supply has been mentioned as possible affecting production of certain cellulose plastics.

COTTON LINTERS—A large portion of the cellulose plastics production is still dependent on cotton. Even with pending price increases, the supply may still be short, especially in view of plastics and rayon expansions.

PIGMENTS AND LUBRICANTS—Shortages are presently affecting vinyl plastics production.

The statement has been made in the public press that, "Most plastics are derived from basic raw materials, the supply of which is almost unlimited. Consequently, there is seldom any problem of obtaining these supplies, such as, coal, limestone, and petroleum, no matter how much demand increases or production facilities are enlarged."

It is the opinion this statement is grossly misleading since the demand for chemicals during the war and up to the present time has emphasized that any large expansion of plastic materials requires expansion in facilities for manufacture of the basic chemicals; the material manufacturers must see that such materials are available and often provide these facilities. This was very aptly covered by Mr. Landes in April of this year, but can bear repeating as the general public is often led to believe that expansion of plastic materials is merely a matter of building a resin and a molding powder plant; it is now evident that the plastics industry has reached such magnitude in use of basic materials that expansion often requires increases in basic chemicals previously considered in abundant supply.

Plastic Materials Supply

In preparing this review of the materials supply situation the Department of Commerce, Bureau of Census reports on plastic materials have been invaluable in following the trend of production. Based on all available data published by the government, together with individual estimates supplied by PMMA members to our office, the supply situation at this time together with probable expansions over the long term has been compiled. This can best be presented for the various groups of materials as used by the industry, particularly in the molding and fabricating end. For some materials and on the summaries, the rates of production are shown in percentages of 1939 and 1941 as 100 to permit comparison with Mr. Landes' report of April, 1946.

Nitrocellulose Plastics

	Pounds
1945 production	15,235,676
1946 production rate	18,400,000

Census' reports for the first eight months of 1946 indicate nitrocellulose plastics are being produced at a rate 20% greater than 1945 production. Incidentally, this is the highest rate of production for pyroxylin plastics since 1937. Even though this was the first plastic material and newer ones have been developed and expanded enormously, the high production rate maintained for this plastic has actually surprised many in the industry.

PMMA members report that availability of nitrocellulose is about equal to demand, and it is anticipated there will be little change in this position.

Cellulose Ester Plastics

Government reports now indicate that production of sheets, rods, tubes, and film in the first eight months of 1946 is running at a rate of 21% in excess of 1945 production. Demand for these materials, particularly for continuous sheeting, continues at a high rate. Producers report demand is substantially in excess of supply, with estimates running as high as 3:1 for certain types of material. In the December survey a short-term increase in continuous sheeting was not forecast. However production has now been increased to the extent already indicated.

[1] Presented at the meeting of the New England Section, S.P.I., Manchester, Vt., Oct. 18, 1946.
[2] General manager, Plastic Materials Manufacturers' Association, Washington, D. C.
[3] See India RUBBER WORLD, May, 1946, p. 235.

Consumers can anticipate even better availability of film through expansions to be completed in 1947; compared with the 1945 rate, PMMA members anticipate an increase amounting to approximately 100%.

TABLE 1. CELLULOSE ESTER MOLDING POWDER
(From Bureau of Census Reports

	Pounds
1945 production	61,123,000
1946 production rate (8 months)	82,000,000
Increase—34% over 1945	

The industry can well be proud of the increased rate of production of cellulose molding powders. From the above figures it will be noted the first eight months of this year show a 34% increase over the average rate in 1945. This is considerably in excess of the rate originally promised for the early part of 1946.

The demand for flake for this type of plastic is still in excess of supply, with the ratio roughly estimated at 2½:1. Members report the ratio of demand to supply for molding powder is approximately 3:1 at this time.

Other Cellulose Plastics

Substantial increases in capacity for other cellulose plastics have already been completed during 1946, and the industry is operating at about 50% over the 1945 rate. During the latter part of 1947, when expansions are completed, consumers can anticipate production rate about 65% greater than 1945. It is the opinion that sufficient raw material will be available to make even more plastics of this type in event the demand warrants such volume.

TABLE 2. ALL CELLULOSIC MOLDING POWDERS
(Base Year as 100)

Base Year	1945 Rate %	August, 1946, Estimated Rate %	Estimated Rate after Expansions %
1939	484	570	745
1941	198	234	305
1945	...	118	154

Table 2 lists the estimated rates of production for all cellulosic molding powders based on members' reports. These are shown as percentages of 1939, 1941, and 1945 totals and permit comparison with former reports from PMMA. During December, 1945, a short-term increase of 6% to 10% and long-range increase of 53% were forecast.

Polystyrene Plastics

The increased production rate for this plastic material has been phenomenal during the past few years. Figures already presented to the Society of the Plastics Industry have indicated the 1945 production rate was 32 times the rate in 1939. Table 3, based on Census' reports, indicates an increase of 128% over the last four months of 1945. July and August of 1946 production increases are in the magnitude of 190% over the last four months of last year.

TABLE 3. POLYSTYRENE PLASTICS
(From Bureau of Census Reports)

	Annual Production Rate —Pounds
1945 based on last four months	23,500,000
1946 based on seven months	53,700,000
Increase—128% over 1945	

Polystyrene Molding Material

Consumers can anticipate increased availability of this material from month to month. By January 1, 1947, it is anticipated the rate of production will approach four times the average rate attained during 1945. The demand-supply ratio is roughly estimated as 2½:1 at this time. The industry has been well advised of expansion plans in polystyrene material through statements made public up to now. As shown in the table, the additional facilities now contemplated for completion late in 1947 will provide polystyrene in amounts almost ten times that available in 1945.

Table 4 lists estimates of molding powder production by PMMA members. It would appear that the original forecast on the growth of polystyrene molding material through their own expansion programs is actually being exceeded.

TABLE 4. POLYSTYRENE MOLDING MATERIAL
(Base Year as 100)

Base Year	1945 Rate %	August, 1946, Estimated Rate %	Estimated Rate after Expansions %
1939	3260	11,130	31,200
1941	388	1,040	3,705
1945	...	268	955

Estimated rate, January 1, 1947—374% of 1945 actual production.

Vinyl Resin Plastics

Producers report capacity production on most of the vinyl plastics at present. Demands for vinylidene chloride, polyvinyl chloride, and copolymer resins and compounds, especially the elastomeric type, are approximately three times the available supply. It is difficult to give precise figures on the present rate of production compared with 1945. During the latter part of that year the full capacity of the industry was not being utilized because of reconversion problems in the plants of producers and consumers. With the change from war to civilian production, the end-use pattern for these materials has changed extensively. Based on the Census' reports for seven months of 1946, the increase over the last five months of 1945 is roughly estimated at 50%.

Other vinyl plastics such as polyvinyl butyral and polyvinyl acetate, although running at higher production rates than in 1945, are believed to be in sufficient supply at present.

TABLE 5 ALL VINYL PLASTICS
(Base Year as 100)

Base Year	1945 Rate %	August, 1946, Estimated Rate %	Estimated Rate after Expansions %
1939	1250	1438	3000
1941	373	429	895
1945	...	115	240

Since the earlier reports on expansion plans for the industry, further increases have been announced for certain vinyl resins. Table 5 shows the estimated current production rate for all vinyl plastics and the estimated rate after the recently announced expansions have been brought in. It will be noted that these materials should be available in amounts 2.4 times the production in 1945 when new facilities are completed late in 1947.

Phenolic Molding Materials

Production of phenolic molding materials through August was operating considerably in excess of the 1945 volume. The figures shown in Table 6 for the entire industry indicate the forecasts made earlier in the year are being exceeded. Acute shortages of certain materials and labor difficulties now affecting production have already been mentioned. There is little need of discussing this matter further except to indicate that a decided drop can be anticipated in production during the balance of the year.

TABLE 6. PHENOLIC MOLDING MATERIALS
(From Bureau of Census Reports)

Annual Rate	Pounds
1945 (based on last 6 months)	119,000,000
1946 (based on first 7 months)	151,000,000
Increase over last 6 months of 1945	27%
July, 1946, rate increase over last 6 months of 1945	43%

Estimates of present production and expected future rates of production are shown as percentages based on former years' volume in Table 7. It was originally anticipated that a 42% increase over 1945 would be available early in 1947; it is believed this can now be increased to 80%.

TABLE 7. PHENOLIC MOLDING MATERIALS
(Base Year as 100)

Base Year	1945-Rate %	August, 1946, Estimated Rate %	Estimated Rate after Expansions %
1939	185	267	334
1941	107	154	193
1945	...	144	180

Amino Molding Powders

Producers report near capacity operations for amino molding powders, with demand almost four times the availability. Substantial increases in production over that available in 1945 have already been made; further expansions are under way for completion the latter part of 1947. In December, 1945, a forecast of 25% by April and 80% increase by the latter part of 1946 was estimated. It is believed the short-term expansion has now been achieved and that the long-term increase will be in excess of these figures. No Census figures for molding material are available; the best estimates for members' current production and planned increases are included in Table 8 estimates of thermosetting molding powder production.

Miscellaneous Plastics

TABLE 8. SUMMARY OF PLASTICS PRODUCTION
Molding Powders
(Base Year as 100)

	1945 Rate %	August, 1946, Estimated Rate %	Estimated Rate after Expansions %
THERMOPLASTICS (Vinyls not included)			
Based on 1939	652	1040	2340
1941	230	369	826
1945	...	160	360
Aug., 1946	...	...	224
THERMOSETTING			
Based on 1939	187	262	357
1941	110	157	214
1945	...	140	192
Aug., 1946	...	...	137
ALL MOLDING POWDERS (Vinyls not included)			
Based on 1939	261	386	667
1941	140	208	358
1945	...	148	256
Aug., 1946	...	...	173

The production of synthetic resin adhesives, both phenolics and ureas, is currently operating considerably in excess of 1945; PMMA members report present operations increased from 25 to 90% over the former period, and demands about 1½ times the supply. Some expansion in adhesive manufacturing capacity has been made, although definite information on percentage estimates on this increase is not available. Because of these and additional facilities under contemplation, the industry can rest assured that manu-

facturing capacity will not seriously curtail production of these materials.

PMMA members report production of acrylic, nylon, polyethylene, and other miscellaneous plastics well in excess of 1945 rates. A fourfold expansion has been possible for certain molding materials, and substantial capacity brought into operation for other newer materials. Figures on all of these materials are included in the summaries in Table 8.

The demands for laminating and industrial resins are somewhat in excess of current supplies, even though producers are operating at rates substantially above the 1945 production. In some cases operations have been increased by 100%. The same situation holds for cast resins, particularly the phenolic type.

Table 8 summarizes the thermoplastic, thermosetting, and total molding powder production, expressed as percentages of former years taken as 100. This will permit comparison with tables and figures presented by Mr. Landes in April of this year.

The data for thermoplastic molding powders include all materials currently produced by the PMMA members with the exception of vinyls, since it is difficult to estimate the portion of this material actually entering into molding or extrusion production. It will be noted that current production is now 1.6 times that available during 1945, or 3.6 times the 1941 production. S.P.I. members will recall that this was the earliest year for which some information was available on molding and extrusion equipment for the industry. The estimated volume available with completion of new facilities is now estimated at 3½ times that provided for the industry in 1945, and eight times that used in 1941.

Similar, but not so extensive an increase is also estimated for thermosetting molding powders. As of August of this year, operations were 40% above 1945, and the total availability will almost be doubled with completion of new facilities now under way.

The molding industry appears to be using all types of materials at twice the rate attained in 1941, and 48% greater than 1945. On the basis of estimates from PMMA members, plans for additional facilities are now under way to provide total molding materials in amounts about 2½ times that available in 1945.

All Plastic Materials

TABLE 9. ALL PLASTIC MATERIALS*
(Base Year as 100)

Base Year	Production Rate—% 1941	1945
1939	200	364
1941	...	182

* Based on government reports—includes certain synthetic resins for protective coatings and coumarone-indene resins.

PMMA ESTIMATES

Base Year	1945 Rate—%	August, 1946 Rate—%	Estimated Rate After Expansion
1939	335	458	656
1941	174	238	342
1945	...	140	200

To complete the picture of plastic materials production, Table 9 has been prepared from data available and estimates supplies *re* expansion programs. The first portion shows the percentage growth for all materials based on production in 1939 and 1941 as 100. This portion of the table is based on government reports of plastic materials and synthetic resins production; it includes all cellulose plastics, coumarone-indene resins, and resins for protective coatings. Note that production in 1945 was double that in 1941.

Also in Table 9 are included the best estimates (believed to be conservative) of current production and the extent of expansions as indicated by PMMA members. It will be noted that estimated August rate of production is now more than double (238%) that of 1941; also significant is the ultimate production rate doubling that attained in 1945.

Future Growth

The tremendous expansion program now under way by the materials manufacturers certainly demonstrates their faith in the sound growth of the plastics industry. The long-range importance of maintaining quality of production and sound applications of plastic materials cannot be stressed too much. Now is the time when reputations can be made which will have a telling effect when competition becomes severe. The whole industry will benefit if more and more members refuse to lower the standards of quality under the existing stress of material shortages.

Under present conditions of chemical shortages, labor difficulties and heavy industry requirements, the manufacture and equitable distribution of plastic materials has become a trying problem. It is recognized that the molders and fabricators are likewise confronted with similar disagreeable situations. Only full cooperation on these mutual problems will make it possible to improve this condition.

To permit better planning by the material manufacturers, it is suggested that customers make their requirements known as far in advance as possible. The program of sending orders in on a monthly basis during wartime allocations was a step in this direction. Under present conditions it is also essential that orders are not pyramided and that only the types and quantities required to meet minimum commitments are requested.

The industry members should plan ahead with their suppliers. Without accurate advance knowledge of requirements and such business planning, the necessary large capital investments to provide additional material cannot be made. Along these lines it would be helpful if molders would consult their suppliers before making large commitments for fabricated or molded parts. With present shortages it may even be desirable for prospective purchasers of new parts or devices to postpone their introduction until a supply of necessary plastic materials is assured.

It is still uncertain whether or not the expansions under way will take care of the industry requirements. Based on the estimated potential capacity discussed by Mr. Landes in April, the pending increases in molding powder, although higher than forecast at that time, will still not close the gap between the availability and the machine capacity curves. When the present injection and extrusion capacities together with pending expansions are considered, there is still a shortage, if full operations are to be maintained.

Unquestionably the chemical industry and the material manufacturers will take the necessary steps to provide additional material when it is demonstrated there is an actual market. The biggest question now facing the material manufacturers is to what extent, if any, press capacity has been overexpanded in terms of potential markets for fabricated parts.

To provide good future planning the material manufacturers must have accurate estimates: an expansion program can best be set up by appraising the requirements of the market as a whole on the assumption that a certain percentage will be obtained. Molders and fabricators can assist in this future planning through cooperation to forecast their own requirements and avoid indicating to each manufacturer that they expect to use his particular material to the complete capacity of his molding shop. Such information might well be gathered by S.P.I. through its membership and probably be more accurate than any survey conducted by PMMA members. These figures could be submitted to S.P.I. and be kept strictly confidential with only the totals passed on or made available to the material manufacturers. In this manner a clear picture of the total requirements of the industry could be obtained.

With supplies of basic raw materials becoming more critical and the many uncertainties in regard to equipment and construction, the materials manufacturers are going to be hesitant to make further commitments on expansions until costs and labor are stabilized. Anything the S.P.I. can do to assist in accurate planning by the materials manufacturers will certainly be to the benefit of the industry and welcomed by PMMA members.

Plastics Retailing and Merchandising Courses

THE Society of the Plastics Industry, 295 Madison Ave., New York 17, N. Y., in collaboration with New York University, has commenced a course in plastics retailing and merchandising, the first of its kind in this country. Begun September 30 with an introduction by George K. Scribner, SPI chairman of the board and president of Boonton Molding Co., the schedule runs each Monday evening and will conclude on January 20, 1947, after 14 lectures. The course carries university credit and is pointed toward the interests of the retailer, the home economist, and the consumer, covering all types of plastics, their processing, design, and use in the store, industry, and home. The schedule of subjects was arranged by the Society's committee on education, headed by Horton Spitzer, of Plaskon division, Libbey-Owens-Ford Glass Co., who predicted that this is only the beginning of a number of such courses to follow at institutions farther west.

The schedule of the course follows: September 30—Introduction by Mr. Scribner; October 7—"Types of Plastics," by Gordon Kline, National Bureau of Standards; October 14—"Consumer, Retailer and Plastics Industry," by D. S. McKenzie, General Electric Co.; October 21—"Cellulose Plastics," by Marie Bentivoglio, Celanese Corp.; October 28—"Polyvinyl Resins," Jack R. Hoover, B. F. Goodrich Co.; November 4—"Acrylics," by D. A. Rothrock, Rohm & Haas Co., and "Polystyrenes," Amos Ruddock.

Dow Chemical Co.; November 18—"Phenolics," Clint Blount, Bakelite Corp., and "Ureas and Melamines," by M. H. Bigelow, Libbey-Owens; November 25—"Miscellaneous Plastics," by R. B. Akin, E. I. du Pont de Nemours & Co., Inc., December 2—"Laminates," L. J. Francisco, Formica Insulator Co., and "Contact, Low-Pressure, Plywoods," by W. Burdette Wilkins; December 9—"Design in Plastics," Peter Muller-Munk; December 16—"Plastics in Packaging and Display," Christopher Browne, *Modern Packaging Magazine;* January 6—"Plastics in the Home," James R. Turnbull, Monsanto Chemical Co.; January 13—"Apparel, Accessories," Mark Bortman, Bortman Plastics Co., and "Clothing, Nylon Stockings," Edgar Schlesinger, Cohn-Hall-Marx; January 20—"Merchandising Highlights," Alfred Auerbach, and "Summary" by Charles A. Breskin, *Modern Plastics Magazine.*

In the introduction to the course, at the initial session on September 30, Mr. Scribner gave a general lecture on the development and future of plastics in American life. Citing the need of public comprehension of plastics, the speaker underscored the need of correct interpretation of the newer materials and called for public tolerance of occasional lapses because of misapplication. He warned against over-simplification in applying plastics and gave examples of misuse.

The second lecture in the series, "Types, Properties and Processing Methods," was given by Gordon M. Kline on October 7. Explaining the resins with exhibits and charts, Dr. Kline outlined types of thermosetting and thermoplastic resins, plastic properties, and concluded with a discussion of production methods.

SPI Midwest Chapter Meeting

The autumn meeting of the Midwest Chapter, SPI, will be held November 7 and 8 at French Lick, Ind. Four technical papers will be presented in morning sessions, and a banquet meeting is scheduled for the evening of November 7. The committee in charge of the meeting includes Norman Anderson, General Molded Products, Inc.; Charles F. Elmes, Elmes Engineering Works; Marvin M. Lane, Croname, Inc.; and W. K. Woodruff, Celanese Plastics Corp.

Papers to be presented are: "Teflon," by E. B. Yelton, of du Pont; "Plastic Materials Outlook," by Frank Carman, of the Plastics Materials Manufacturers Association; "Roll Leaf Stamping on Plastics," by C. A. Lydecker, Peerless Roll Leaf Co.; and "Printing on Vinyl Films," by Chester M. Robbins, Aridye Corp.

Chapter 6 of SPI Handbook Ready

The sixth chapter of its technical handbook is being released early in November by the Society of the Plastics Industry. Entitled "Design of Molded Articles," the 14-section chapter offers a complete presentation of design problems and the solution in the average plant. The study was prepared by a 12-man committee under the chairmanship of C. A. Norris, with D. M. Buchanan as his alternate; both of Bakelite Corp. Other committee members were G. A. Berg, J. H. Whittemore Co.; W. M. Hoyt, Jr., of International Business Machines Corp.; T. S. Huxham, of Bell Telephone Laboratories; F. C. Meacham, Northern Industrial Chemical Co.; Warren V. Prince, Prince Industrial Plastics Corp.; R. W. Post, Boonton Molding; Walter E. Rahm, of du Pont; H. M. Richardson, DeBell & Richardson Co.; W. B. Ross, Diemolding Corp.; and H. V. Steele, Auburn Button Works, Inc.

The chapter opens with a résumé of the six basic principles of proper design: (1) selection of type of molding material after analysis of the part; (2) listing of design fundamentals and making basic drawing; (3) adding of color and style-form; (4) preparation of complete mechanical drawings; (5) construction of a scale model for demonstration; and (6) setting up of a single-cavity mold to study possibility of mold shrinkage, dimensional inaccuracy, interchangeability in assembly, and serviceability of the piece. Following these principles will avert expensive changes after molds have been completed, with resultant production losses. The chapter, divided into sections following the basic principles, covers shrinkage, radii and fillets, undercuts, wall thickness, taper or draft, ribs, bosses, holes, flash lines, surface treatment, molded lettering and threads.

The new chapter, and all preceding ones with the exception of the first, are available in booklet form at the SPI office, 295 Madison Ave., New York. Prices are as follows: one to four copies, $1 each; five to nine copies, 85¢ each; 10 to 14 copies, 80¢ each; and 15 or more copies 75¢ each.

Plastics Exposition Committee Named

Neil O. Broderson, SPI president, has named members of the committee to direct the second National Plastics Exposition to be held in Chicago on May 5 to 11, 1947. Allan Fritzsche, of General Industries Co., is chairman of the committee, and the following were named to serve with him: R. E. Blanchard, of Stimson AGA Plastics; Allan Brown, of Bakelite; Charles F. Elmes; J. R. Hoover; J. L. Howie, Jr., Grigoleit Co.; Elmer E. Mills, Elmer E. Mills Corp.; Edward J. Pechin, of du Pont's plastics division; J. W. Stokes, Chicago Molded Products Corp.; and J. R. Turnbull.

CALENDAR

Nov. 7-8.	Midwest Section, Society of the Plastics Industry, Inc. French Lick, Ind.
Nov. 8	Connecticut Rubber Group. Fall Meeting. New Haven, Conn.
Nov. 11-Dec. 7.	"Buy Extra United States Savings Bonds" Drive.
Nov. 12.	Los Angeles Rubber Group Inc. Mayfair Hotel, Los Angeles, Calif.
Nov. 22.	Akron Rubber Group, Mayflower Hotel, Akron, O.
Dec. 2-6.	American Society of Mechanical Engineers. Annual Meeting. New York, N. Y.
Dec. 2-7.	Seventeenth National Exposition of Power & Mechanical Engineering. Grand Central Palace, New York, N. Y.
Dec. 3.	Los Angeles Rubber Group, Inc. Mayfair Hotel, Los Angeles, Calif.
Dec. 6.	Boston Rubber Group. Christmas Party. Copley Plaza Hotel, Boston, Mass.
Dec. 13.	New York Rubber Group. Christmas Party. Hotel McAlpin, N. Y.
Dec. 13.	Detroit Rubber & Plastics Group, Inc. Detroit Leland Hotel, Detroit, Mich.
Dec. 20.	Ladies' Night Christmas Party. Chicago Rubber Group. Morrison Hotel, Chicago, Ill.
Jan. 14-17.	National Materials Handling Exposition. Public Auditorium, Cleveland, O.
Jan. 15-31.	March of Dimes.
Jan. 23-26.	Low-Pressure Division, Society of the Plastics Industry, Inc. Edgewater Beach Hotel, Chicago, Ill.
Jan. 25-31.	Plastics Show and Convention. Society of Plastics Engineers. Navy Pier and Congress Hotel, Chicago, Ill.

Plastics Engineers Convention

THE Society of Plastics Engineers, through J. O. Reinecke, general chairman, has announced a change in date for its third annual plastics show and convention, to be held on the Navy Pier in Chicago. The new date of the show is January 25 to 31, 1947, in place of that previously announced. The date of the technical session, to be held at the Congress Hotel, remains the same, January 27-31.

The show and convention committees, meeting in Chicago on October 15 and 25, have reported progress along all lines. The exhibition will be open to the public, with certain afternoon hours during the week being restricted to the trade. Floor plans and brochures are being issued to prospective exhibitors by W. B. Hoey, exhibits chairman. According to William L. Hess, chairman of the meetings committee, some 30 papers by outstanding members of the plastics and allied industries will be presented during the technical sessions.

Plastic-Coated Work Gloves

MONSANTO Chemical Co., St. Louis, Mo., has predicted that plastic-coated fabrics will be used in many of the 200 million pairs of work gloves that will be sold in 1947. In the current leather shortage, glove manufacturers have turned to vinyl butyral plastic, a Monsanto product, and have experimentally produced models of lighter weight, improved grip, greater resistance to soiling, and comparable wearing properties. The wearer can use a solvent to remove any oil and grime from the plastic-coated glove surfaces, and the plastic is also said to be relatively unaffected by repeated launderings.

Glove manufacturers will use Canton flannel coated with vinyl butyral to form the thumb, index finger, and palm the surfaces most affected by wear and soiling. Untreated Canton flannel, permitting the glove to "breathe," will form the backhand sides of the other fingers. Indications are that the first of these gloves will reach retail sales counters this fall, and that they will be in the price range of familiar so-called combination work gloves.

RUBBER WORLD
NEWS of the MONTH

Highlights—

International allocation of rubber will be discontinued after December 31, 1946. An additional 200,000 tons of rubber at a reduced price of 20¼¢ a pound was purchased from the British for delivery during the last quarter of 1946. The CPA Industry Advisory Committee recommended the continuation of domestic specifications and allocation controls until at least April, 1947. A meeting of the international Rubber Study Group is scheduled for the United States in November. Increased amounts of natural rubber will be permitted in tires and other products during the last two months of 1946. Industry operations continue at a high level, but the decontrol of tires will not be possible until some time in 1947. The URWA policy committee on wages met on October 27 and 28 to consider new wage demands on the industry to offset the increased cost of living.

Natural vs. Synthetic Battle Begins Early

An official announcement on October 1 by our State Department that the Reconstruction Finance Corp., through its subsidiary, Rubber Development Corp., will seek to purchase from Malaya all natural rubber allocated to the United States by the Combined Rubber Committee from United Kingdom sources up to a total of 200,000 tons, at a price of 20¼¢ (U. S. currency) per pound for standard sheets delivered f.o.b. ocean going steamer at Far Eastern ports through December 31, 1946, was the first in a series of events which occurred during October and which emphasized that the battle between natural and synthetic rubbers for world markets was to begin earlier than expected. This 200,000 tons of Malayan natural rubber is in addition to the amount already purchased under the agreement of June 21, 1946, at which time the price was 23½¢ per pound. Also this brings the total amount of natural rubber purchased during 1946 by this country to more than 500,000 tons, a much higher figure than was considered possible earlier this year.

On October 10 it was announced that the Combined Rubber Committee, having recommended allocations of natural rubber for the fourth quarter of 1946, has agreed that, in view of the increased quantities of natural rubber becoming available, international allocation control need not be continued beyond the end of this year. The member governments (United States, United Kingdom, Netherlands, France, Belgium, and Canada) have, therefore, agreed that the Combined Rubber Committee be terminated as of December 31, 1946.

These two announcements immediately produced speculation as to whether or not governmental controls within the United States would be relaxed earlier than the expiration of the Second War Powers Act, on March 31, 1947, which Act provides the authority for these domestic controls. Present government controls involve the purchase and importation of natural rubber by the Rubber Development Corp., the distribution of both natural and synthetic rubber by the Office of Rubber Reserve on allocation authority of the Rubber Division, CPA, together with the production of synthetic rubber by Rubber Reserve, and the control of the use of rubber in end-products by the Rubber Division, CPA.

Although opinion was unanimously favorable in this country with regard to the abandonment of international allocation of natural rubber, opinion on the policy to be followed on domestic controls was divided. The majority opinion, however, seemed to favor a continuation of present government controls until April, 1947, or even later.

Imports of natural rubber increased to 45,000 tons in August and stocks on hand rose to 186,000 tons.

Comments by P. W. Litchfield

P. W. Litchfield, of the Goodyear Tire & Rubber Co., was reported to have taken the position that premature lifting of controls in the United States on purchasing and use, to coincide with the removal of controls over world allocations, might well lead to a chaotic rise in the price of natural rubber. If the production of synthetic rubber can be kept up to full economic capacity, world needs of rubber next year can be comfortably met with a slight margin of safety through the combined production of natural and synthetic rubbers, he pointed out. However, lifting of controls on synthetic and natural rubber use in the United States and permitting free purchase of natural rubber on the world market by private American interests can easily lead to a disruption of demand for synthetic rubber and a concerted rush for the short supply of natural rubber.

"While our ultimate goal remains the complete removal of wartime controls which were made necessary by the acute shortage of natural rubber, we must be careful not to decontrol until we are certain that there is no longer a shortage of natural rubber," Mr. Litchfield stated.

By the end of the first quarter of 1947, when present United States controls will expire, the supply situation will have cleared sufficiently to permit return to a free market, and also as an additional requirement for the return of a free market, a definite policy on synthetic rubber should have been legislated here.

Other Comments on Rubber Policy

Reports in the *New York Journal of Commerce* during the latter part of October and indicated as originating in Akron discussed the future of the synthetic rubber industry and the opinions expressed by various industry spokesmen on the measures to be taken with regard to the disposal of the government owned synthetic rubber plants. The synthetic rubber industry in this country will settle down to about one-third its present size (about 300,000 tons a year) when the world supply-demand situation for natural rubber gets into balance, it was said. At the present stage of development it is held that synthetic rubber can compete on an equal footing with natural rubber for about 15% of the rubber uses in the United States. In price, a spread of about 33% between natural and synthetic rubber must be maintained if stiff buyer resistance to synthetic rubber is to be overcome. On a free market basis, industry leaders believe that natural rubber can be delivered at New York at 12¢ a pound; while the best price that can be made for synthetic at the present stage of development is 12.5¢ a pound, at the factory. With the price of synthetic rubber now at 18.5¢ a pound, the price of natural rubber cannot be far above that level. Leaders in the industry, however, feel that the price of natural rubber should not at this stage of the game be allowed to fall below 21¢ a pound, lest the competition prove too stiff for the new synthetic rubber industry.

On the question of the disposal of synthetic rubber plants, one group in the industry takes the position that the sale of the government plants to private interests be accomplished as soon as possible. A second group advocates retention of government ownership at least until the international situation and the world supply picture on natural rubber clear. A third group feels that the government should remain in business indefinitely as the sole large supplier of synthetic rubber.

If sale of the plants to private industry is to be made, the first move of the government must be to decide what portion of its investment is to be written off as part of the war costs. Also the rubber industry is reluctant to make any large investment in these plants because it is feared that they may become outmoded by further improvements in synthetic rubber and better processes of manufacture. The industry is in complete agreement, however, that whatever disposition is made of the plants, definite legislation protecting synthetic rubber must first be enacted if production is to be maintained at any appreciable level.

CPA Industry Advisory Committee Meeting

A general program for the first quarter of 1947, calculated to give the public tires and other products made with a higher percentage of natural rubber and at the same time keep alive the war-born synthetic rubber industry as a national defense measure, has been approved by the Rubber Industry Advisory Committee, the Civilian Production Administration said on October 22.

At the same time the Committee recommended the temporary continuation of public purchase of rubber through the Rubber Development Corp. of the RFC and also recommended that synthetic rubber be produced in quantity sufficient to eliminate necessity of GR-S allocation during the first quarter next year.

The tentative 1947 rubber utilization program, which would take advantage of an unexpected increase in the supply of natural rubber while following the recom-

mendations of the Inter Agency Policy Committee on Rubber on the minimum use of synthetic rubber, was outlined by W. James Sears, director of CPA's Rubber Division, and approved by the Committee.

The program was based on an estimated use of 1,002,777 long tons of both natural and synthetic rubbers in 1947, compared with an annual prewar use of between 700 and 800 thousand tons. Of this total, 258,000 long tons would be consumed in the first quarter. Approximately 50% of this amount would be natural rubber, which would insure the consumption of synthetic rubber at the level required to meet the objective of IPCR.

This program could be met even if specifications were relaxed to permit 100% natural rubber airplane, truck, and bus tires; 50% natural rubber passenger tires in 7:00-inch cross-section and larger, and 33% natural rubber in smaller passenger tires Mr. Sears said.

Estimates of natural and synthetic rubber consumption for the three remaining quarters of 1947 could not be discussed with any accuracy, the Committee said. The Second War Powers Act expires March 31, 1947, and if no other controls are established on natural rubber usage, demands might exceed the supply, which could affect the level of United States imports.

It was also pointed out that in the absence of controls the price differential between natural and synthetic rubber would affect consumption. Also Congress has not acted upon the IPCR recommendation for a continuing consumption of synthetic rubber. In view of these uncertainties it was agreed that the program could cover only the first quarter of 1947.

Members of the committee said that specifications and allocation controls such as are provided in CPA Order R-1, under which the rubber program operates, should be continued until at least March 31. It was also suggested that similar controls will be needed to keep the synthetic rubber industry alive after the Second War Powers Act expires.

The advantages of the synthetic rubber industry in national defense were stressed in Committee discussions, and the Committee agreed to study what type of control on the manufacture of rubber products should be recommended to Congress to implement the recommendations of IPCR.

The above information which was contained in a press release from the CPA also included a statement to the effect that "recommendations and opinions expressed at such meetings by industry representatives do not necessarily represent the views of the CPA."

CPA Permits GR-S Export

Mr. Sears on October 25, announced that GR-S will again be authorized for sale for export. Both GR-S and GR-S latices will be available. During the past several months, when the available supply of GR-S was so badly needed to meet expanding domestic production of rubber goods, it was necessary first to reduce the tonnage of GR-S permitted to be exported and then to prohibit such exports. With the new agreements concluded in Washington during October for more than 200,000 tons of natural rubber to be delivered to the United States during the last quarter of 1946 and the first quarter of 1947, the overall new rubber supply situation has improved to the extent that it is now possible to provide GR-S for those countries anxious to acquire it.

There has been no restriction on the export of special-purpose synthetic rubbers other than GR-I (Butyl), Butyl rubber is still in short supply and will remain under international allocation until December 31, 1946.

Orders for GR-S for export should be addressed to the Sales Department, Office of Rubber Reserve, RFC, Washington 25, D. C.

RMA Report on Rubber Consumption

The Rubber Manufacturers Association, Inc., last month released two reports on rubber consumption by domestic manufacturers, giving figures for natural, synthetic, and reclaimed rubbers during June, July, and August. Also included are figures for the eight months from January 1, 1946.

A table covering the estimated consumption is given below:

ESTIMATED RUBBER CONSUMPTION BY DOMESTIC MANUFACTURERS
(Long Tons)

Type	June	July	August	Eight Months of 1946
GR-S	53,181	44,654	47,840	438,754
GR-M (Neoprene)	3,134	3,326	3,875	27,259
GR-I (Butyl)	6,078	6,097	6,788	54,284
GR-A (N Type)	506	485	553	3,542
Total manufactured rubber	62,899	54,562	59,784	523,839
Natural rubber	16,466	21,998	28,338	134,861
Total natural and manufactured rubber	79,365	76,560	88,122	658,700
Reclaim rubber	21,725	21,350	24,246	176,587

Rubber Study Group Meeting

Another meeting of the Rubber Study Group, which comprises representatives of the governments of the United States, Great Britain, France, and the Netherlands will be held in this country during the latter part of November. The chief purpose of this meeting will probably be to allow the major producing and consuming countries to exchange ideas on the current rubber situation. With international controls on the allocation of rubber ending on December 31 and with some sort of free market in the offing for next year, the Group should have much currently significant material for discussion.

Navy Research on Guayule

The Office of Naval Research announced during October from Salinas, Calif., that the Navy will conduct a program of fundamental research on natural rubber in that area. The research will be conducted in part at Salinas, where the Department of Agriculture has been carrying on similar research, and in part at Stanford University. The program will be administered by Stanford University.

No new commercial plantings will be undertaken. To provide the small amount of raw material necessary for research purposes some 300 acres, less than 1% of the wartime acreage of rubber-bearing plants in the country, will be retained. This small acreage is of selected stocks for plant breeding purposes and for use in processing studies.

Research conducted during the war as part of the Emergency Rubber Project of the Department of Agriculture contributed materially to the knowledge of how to grow natural rubber in this country, it was said. This direct wartime program is now in the final stages of liquidation. This project was directed, toward the wartime goal of rapid production of rubber. Fundamental research which requires many years to yield results was not undertaken.

The present program will be of fundamental research directed toward solution of basic problems to provide all information needed for national security in any future emergency, and the research will not be confined to any one source of natural rubber, but will include studies of all rubber-bearing plants capable of being grown in this country.

Industry Operations at High Level

In spite of difficulties with variable grades of natural rubber, less than the desired production of synthetic rubber, continuing component material shortages, and some labor trouble, the rubber goods producing industry will probably consume more rubber in 1946 than at any other time in its history. Consumption of natural and synthetic rubbers increased from 76,560 tons in July to 88,122 tons in August, according to the latest reports, and to this may be added the consumption of reclaimed rubber which in July amounted to 21,350 tons and in August to 24,246 tons. With the increased allocations of natural rubber during the third quarter and the even greater increase contemplated for the fourth quarter, a consumption record of 1,000,000 tons of rubber for 1946 may be attained by the U. S. rubber industry. The consumption of natural rubber increased from about 22,000 tons in July to 28,350 tons in August.

A contemplated change in CPA Order R-1, effective November 1, will permit 100% natural rubber for airplane, truck, and bus tires; 50 to 67% natural rubber for passenger-car tires of 7:00 cross-section and larger, and 33% natural rubber in smaller passenger-car tires. In addition natural rubber will be permitted in about 180 products in which the use of natural rubber had been prohibited up to this time. The first quarter of 1947 consumption of both natural and synthetic is estimated to total about 260,000 long tons.

Another report by Standard & Poor's Corp. of New York on tires and rubber, issued under the date of September 25, reviewed the sales and earnings of Dayton Rubber Mfg. Co., Firestone Tire & Rubber Co., General Tire & Rubber Co., B. F. Goodrich Co., Goodyear Tire & Rubber Co., Lee Rubber & Tire Co., Norwalk Tire & Rubber Co., Seiberling Rubber Co., and United States Rubber Co. The following comment is of interest:

"Dividend payments of virtually all companies in the field have exceeded year-earlier disbursements thus far in their 1946 fiscal years. In view of the continued favorable earnings prospects and strengthened finances, further in-

ESTIMATED AUTOMOTIVE PNEUMATIC CASINGS AND TUBE SHIPMENTS, PRODUCTION, AND INVENTORY—AUGUST-JULY, 1946, FIRST EIGHT MONTHS, 1946, 1945

	Original Equipment	Replacement	Exports	Total Shipments	% of Change from Preceding Month	Production During Month	% of Change from Preceding Month	Inventory End of Month	% of Change from Preceding Month
Passenger Casings									
August, 1946	1,237,584	4,189,998	65,493	5,493,075	+ 9.64	5,790,850	+17.61	2,288,409	+11.54
July, 1946	1,121,659	3,840,337	48,135	5,010,131		4,923,968		2,051,732	
1st 8 mos., 1946	5,887,121	34,548,026	389,387	40,824,534		41,451,935		2,288,409	
1945	234,763	13,750,550	130,348	14,115,661		14,457,768		1,246,012	
Truck and Bus Casings									
August, 1946	446,710	806,787	77,963	1,331,460	+ 7.68	1,263,016	+19.01	718,031	—14.39
July, 1946	407,436	769,595	59,430	1,236,461		1,061,266		838,737	
1st 8 mos., 1946	2,396,036	7,106,888	525,729	10,028,653		10,027,008		718,031	
1945	3,939,868	8,194,644	148,578	12,283,090		12,398,993		825,942	
Total Casings									
August, 1946	1,684,294	4,996,785	143,456	6,824,535	+ 9.25	7,053,866	+17.85	3,006,440	+ 4.01
July, 1946	1,529,095	4,609,932	107,565	6,246,592		5,985,234		2,890,469	
1st 8 mos., 1946	8,283,157	41,654,914	915,116	50,853,187		51,478,943		3,006,440	
1945	4,174,631	21,945,194	278,926	26,398,751		26,856,761		2,071,954	
Passenger Truck and Bus Tubes									
August, 1946	1,696,718	5,107,087	126,732	6,930,537	+16.30	7,032,135	+23.33	3,928,912	— .64
July, 1946	1,513,374	4,344,498	101,322	5,959,194		5,701,851		3,954,149	
1st 8 mos., 1946	8,380,376	36,029,777	859,079	45,269,232		46,374,342		3,928,912	
1945	4,187,609	21,213,058	222,012	25,622,679		26,193,763		2,742,138	

creases in quarterly rates and/or year-end extras appear a reasonable expectation."

Much concern was expressed early in October that the increasing shortage of soap and oil would necessitate curtailment of synthetic rubber production and also the production of rubber goods, but with the decontrol of meat later in the month, it appeared that this difficulty would be avoided. Advice from Washington late in October was that new supplies could be expected before the present stocks will be exhausted.

Reports from the rubber goods manufacturing industry on the quality and the types of natural rubber allocated to them during the past few months were in general agreement as to the lower than prewar quality and the larger than normal proportion of both very soft and very hard grades. The large amount of sand, bark, and other foreign matter in this rubber and the large amount of off-grade rubbers included have necessitated much pretreatment of the rubber before use, and the higher and more variable resin and oil content has required more frequent changes in compound recipes. These difficulties have all added to cost of processing, but the industry seems to feel that an improvement in the quality of natural rubber will gradually occur, and with proper handling of GR-S-natural rubber combinations, processing efficiency will become more satisfactory than when GR-S had to be used without much more than a token amount of natural rubber.

Despite the record-breaking production of automobile tires, the OPA has decided against decontrol of tires at present except possibly bicycle and airplane tires. A survey by the National Association of Independent Tire Dealers, based on about 50% returns from its membership of about 5,000 dealers, showed that more than 80% of those reporting had stated that the demand for tires was higher than three months ago. Besides no change in price is expected while tires remain under price control, but if tires are decontrolled by the Summer of 1947, a decline in price due to heavy competition might take place.

The RMA monthly report on August tire production showed a very appreciable increase of 17.6% in the production of passenger casings over the output for July and a similar increase of 19% for truck and bus casings. An inventory gain of 11.5% was recorded for passenger casings, but the inventory for truck and bus casings declined 14.4%. Tube production increased 23% over July.

The complete report appears in the table above.

The fourth-quarter export quota for truck and bus tires was set at 450,000, approximately 10% of estimated production, CPA reported on October 22. The quota for passenger-car tires was pegged at 350,000, about 1.8% of estimated production.

CPA said that while United States tire production is far in excess of the largest prewar years, foreign production is still facing numerous difficulties, and these tires are needed for maintenance of essential transportation. Truck and bus tires are now being produced at a rate of approximately 1,400,000 per month, as opposed to a prewar monthly output of 725,000 in 1940, the largest prewar production year. Passenger-car tires are now being produced at a rate of about 6,000,000 per month, compared with total 1940 production of about 4,000,000 units.

The third-quarter truck and bus tire quota was 425,000 units, and the quota for passenger-car tires 300,000 units.

Management and Labor Relations

As mentioned last month, one of the most important items in the labor-management field at the present time is the meeting of the new international policy committee of the United Rubber Workers of America, (CIO), originally scheduled for October 21 and later arranged for October 27 and 28 at South Bend, for new wage increases. Some indication of the possible magnitude of the demands is contained in the statement by the union that a request will be made for "substantial wage increases to protect living standards in this period of rising prices." A new contract between The B. F. Goodrich Co. and the local URWA union at Akron was signed during October. A dispute at the Akron plant of the Goodyear Tire & Rubber Co. threatened to shut down this plant late last month. A 115-day strike at the Dominion Rubber Co., Ltd., plant in Kitchener, Ont., Canada, was settled October 18. A similar strike at The Hamilton, Ont., plant of The Firestone Tire & Rubber Co. of Canada, Ltd., was ended on October 20.

The URWA Wage Demand

The October 27 and 28 meeting of the URWA's wage policy committee was expected to consider a report by CIO's economists on the extent of the increase in the cost of living during the last several months, with particular reference to the increase since March, 1946, when the "Big Four" wage increase was negotiated. The question of how much the committee will agree as a reasonable increase will be decided at the meeting. Union officials have been reported as estimating that anywhere from 10 to 35% raises will be necessary to offset the rising cost of living.

A recent report by the Bureau of Labor Statistics may also be considered by the policy committee of the union. This report showed that 80.4% of the workers in the rubber industry received increases of from 18½ to 25¢ a hour since V-J Day and that 11.2% received increases between 5¢ and 18½¢ an hour. Increases of more than 25¢ an hour were received by 5.5%, but 2.9% received no increase. The BLS has also reported that the average weekly wage of the rubber worker has decreased from $64.04 in February, 1945, to $54.76 in June, 1946, because of a reduction in the amount of overtime work done during this period.

At the same time L. S. Buckmaster, URWA president, was reported to have pointed to the government figure for the rise of living costs from February, 1945, to August, 1946, of 35% as underscoring the need of an increase in wages for rubber workers. He also stated that the union was reluctant to force the reopening of the question of wage increases at this time, but since it was apparently impossible to stabilize prices, the union has no alternative.

On October 29, Mr. Buckmaster announced that a demand for a wage increase of 26¢ an hour, effective November 1, had been made upon the "Big

Four" companies. This is in effect a request to reopen the existing "Big Four" contract of March, 1946. The proposed increase would add $104,000,000 to the rubber industry's payroll, it was said.

Goodrich Akron Contract

A new contract between Goodrich at its Akron plants and Local 5, URWA union, was reported as about ready for signing during the latter part of October. If this contract is signed, the Akron local union will be ignoring the requests of other local unions of the Goodrich company in other sections of the country who wanted to negotiate a company-wide contract.

One important feature of the new contract is an agreement which provides for arbitration of disputes between the company and the union by a three-man board. This board will be made up of a representative of the union and of the company and a third member to act as chairman and to be selected jointly by the union and the company. As part of this agreement, the union has stated that it will not strike and the company has agreed not to force a lockout on any question subject to arbitration. Also included is a provision giving the union authority to decide whether production employes are to work more than six hours a day or more than 36 hours a week. More than 4,000 workers were granted wage adjustments under the new contract. More than 15,000 workers at the Akron Goodrich plant are covered by the new contract, which was reported as being 68 pages long.

Other Labor Troubles

Two workers, in the millroom at the Akron plant of the Goodyear company caused a shutdown which made about 10,000 employes idle at this plant. The dispute started on October 18 over a question of a change in piece rates. The two millroom workers walked off their jobs, and other workers joined the walkout. Lack of mixed stock forced other departments to shut down.

A statement by the company reported that the dispute concerned a Banbury mix which presented different material characteristics and called for the establishment of its own specific time cycle. There was no question of speed-up or time cutting in this instance, it was said. The batch had not previously been mixed in the Banbury.

The local union president urged the men to return to work pending negotiation of the grievance, but the strikers refused unless the suspension against the two millroom workers was lifted. A union meeting was held October 22 to present all the facts of the case to the members of the Goodyear local union.

Violence occurred at the plant of the Norwalk Tire & Rubber Co., Norwalk, Conn., in connection with a jurisdictional dispute between the AFL and the CIO unions. The United Mine Workers, AFL, have been picketing this plant for several weeks in an attempt to force an election among the workers. A truck driver leaving the plant with a load of tires was stoned, and in the general fracas which followed one man had to be taken to the hospital, two others were injured slightly, and five arrests were made.

A working dispute at the Anderson Rubber Co. in Akron interfered with production at this plant for about a week last month, but operations were resumed about October 18.

Rubber Items Raised; Many Others Decontrolled

Manufacturers' ceilings have been increased for a variety of rubber items principally used in automobiles, refrigerators, vacuum cleaners, and electrical appliances, under Amendment 29 to MPR 149—Mechanical Rubber Goods—effective October 2. The increases apply to molded, extruded, lathe-cut, and chemically blown sponge rubber products, including refrigerator door strips, bushings, grommets, washers, sponge tubing, bumper strips, wheels, wringer rolls, rings, and hard rubber battery covers.

The price ceiling increases are 17% on approximately 80% of total production of these products, representing items that have price ceilings established by January, 1942, formula pricing methods and costs in effect at that time. On the remaining 20% of production, for which increases already have been granted aggregating 15% over January, 1942, prices, a further increase of 2% is allowed.

OPA said studies had shown that prices 17% above base-period levels are necessary to lift manufacturers' earnings to 1936-39 levels. Thus the increase is mandatory under the price control act.

At the same time manufacturers were granted an increase of 5% in their dollar-and-cent ceilings for rubber flooring to take care of higher costs for labor and materials since February, 1946. This increase is allowed under the agency's reconversion pricing standard, providing the same percentage margin over allowable cost as in the base period.

Resellers of these products, including retailers, are allowed to recalculate their ceilings to give them their March 31, 1946, percentage margin over acquisition cost.

Increases ranging from 4.21 to 14.12% have been allowed in manufacturers' and wholesalers' maximum prices for rubber hose and belting, under Amendment 30 to MPR 149, effective October 14.

The increases are allowed to take care of higher costs for textiles since March 15, 1946. These increases are required by the earnings standard and will allow manufacturers a percentage return on net worth that is not greater than during the 1936-1939 base period. These products are not generally sold at retail.

Amendment 30, however, is of an interim nature. OPA said it will make a detailed study of all cost increases for rubber hose and belting to determine if further price advances are required under the law. The increases are embodied either in new dollar-and-cent ceilings or in percentage terms, over existing ceilings.

Amendment 18, MPR 452—Manufacturers' Maximum Prices for Automotive Parts—extends to automotive vacuum brake and heater hose the price increase of 26.8% at the producer level to reseller sales under MPR 452. Price increase previously had been granted to all hose by Amendment 27 to MPR 149.

Amendment 1, Rev. Order 168, MPR 478—Coated and Combined Fabrics—extended the expiration date of RO 168 from September 30 to October 15 and then again to November 15 (by Amendment 2) in order to give equitable consideration to continued fabric cost increase since August 5 for which the industry had not been compensated by any OPA action and thus to avoid a serious bottleneck to production and distribution of coated fabrics.

As the OPA has found that, as a result of recent increases in textile prices, a further increase of about 7.67% in the current ceilings for the manufacturers of coated and combined fabrics is required to enable this industry to earn during the next year the return on current net worth which it enjoyed during 1936-39, the government agency issued Amendment 18 to MPR 478, which provides for increase factors for rubber pyroxylin, and oil coated and combined fabrics of 34.6, 36.7, and 40.5%, respectively, over the manufacturer's October, 1941, prices.

The following orders have been issued for MPR 478, establishing ceilings for pyroxylin and vinylite coated fabrics for the firms indicated: No. 206, Taylor, Pinkham & Co., Inc., New York, N. Y.; 207, Weymouth Art Leather Co., Inc., South Braintree, Mass.; 208, Fostex, Inc., Spartanburg, S. C.; No. 209, Weymouth.

Order 1, MPR 276, allows a price increase up to 15% for sales of asphalt tiling by Hood Rubber Co., Watertown, Mass.

Amendment 2, MPR 166, increases the maximum prices for leaded zinc oxides to 8¢ a pound and permits the addition of 0.75¢ a pound to the maximum prices of lead-free zinc oxides as previously established under the General Maximum Price Regulation. This adjustment in maximum prices is appropriate under the provisions of Executive Order No. 9599 to maintain essential supply during the reconversion period. Amendment 2 also provides that resellers of zinc oxides may add their March 31, 1946, average percentage mark-ups to their acquisition costs.

Amendment 7, MPR 523, changes the base date for plastics products made from thermosetting laminated materials from March 31, 1942, to January 1, 1941, and at the same time authorizes a compensating 10% increase in manufacturers' prices for these products.

The following orders have been added to RMPR 528 setting retail ceilings for the new products indicated: No. 138, a 6.00-9, 10-ply Rib Industrial tire made by The Goodyear Tire & Rubber Co., Inc., Akron, O.; No. 139, seven sizes of U.S. Royal Air Guard passenger-car tubes, United States Rubber Co., New York, N. Y.; No. 140, 12.00-24 Waber Special-Purpose Truck tube, The Waber Co., Chicago, Ill.; No. 141, six sizes of Fisk Safti-Wave passenger-car tubes, U. S. Rubber.

Order 13, RMPR 111, approves ceilings for sales by dealers of three models of vacuum cleaners manufactured for sale by the Firestone Tire & Rubber Co., Akron, O.

A ceiling of 6¢ a pound "as is, where is" for sales by WAA of used surplus inner tubes classified as "R" or "C-1" by the Army or as "B" by the Navy was set by Order 141 to SO 94—Special Maximum Prices for Mixed Repairable Tubes — effective October 25. These tubes, OPA said, will not be separated as to size and condition. Since only part of them are repairable, it would be impractical and unnecessarily expensive for WAA to separate and sell separately according to quality all of the sizes being priced. Purchasers of the tubes, OPA said, are expected to sort them and repair those that might be made sound. Those repairable tubes will be priced for resale under the used tire and tube regulation, RMPR 528. Those not repairable will be sold as scrap under the scrap rubber regulation, RPS 87.

Rev. SO 44, Amendment 4—Designated Commodities in Hawaii—and Amendment 111 (1418.151), RMPR 373—Tire Retreading and Recapping in Hawaii—cover making applicable to the Territory, RMPR 528 except as it relates to recapped tires and tubes, which continue subject to RMPR 373. Now tires and tubes, used tires and tubes, and tire and tube repairing, accordingly, have been transferred from 373 to 528.

Removed from Price Control

Exemption from price control of several unrelated products including sulfur was announced October 3 by OPA, which at the same time suspended from price control specified automotive parts and accessories when sold by manufacturers, elastic braid and cord, and woven elastic webbing.

Sulfur was exempted because production and producers' stocks are more than adequate to meet demands. On June 30, 1946, producers held stocks substantially larger than the total production for the peak year, 1945. Moreover sulfur has on the average been selling at below ceilings. For these reasons decontrol should not result in any increase in domestic prices.

Elastic webbing is used in making underwear, garters, suspenders, girdles, corsets, shoes, and surgical supplies. Elastic braid is mostly made in narrow width, and the amount used in a finished article, such as underwear, hats, sporting goods, house furnishings, and garments in general, amounts to only a few inches. Supplies of these products are adequate, and while some price increases to reflect higher cotton costs are expected, the increases should not be greater than would be permitted under OPA pricing standards if they remained under control.

Sand blast stencils, balloons for radio and weather observation, coated fabric tire covers and winter fronts, and a few specified automotive parts and accessories when sold by a manufacturer have also been suspended from control.

(Amendment 57 under SO 129)—Exemption and Suspension from Price Control—effective October 4, 1946.)

On October 9 several items of rubber, chemical, drug, lumber, and miscellaneous automotive equipment were removed from price control by Amendment 58.

Exempt from further price control because supply is in balance with demand are bus mileage, lawn mower tires, acetone and chestnut extract.

Bus mileage, OPA said, refers to the practice of large bus lines which generally do not buy their tires outright, but instead enter into contracts with rubber companies whereby the latter furnish, replace, recap, and service the tires on the buses. The rubber company is then paid an amount based upon the number of miles driven. Bus mileage accounts consume a very small portion of truck tire production, OPA pointed out, and prices for this service are well below ceiling.

Exemptions and suspensions based on a determination that the items are not important in either business or living costs include, among others, casein glue; textile warp sizes; finishing and printing materials; specialized automotive equipment; bathing shower caps; used bicycle tires; and miscellaneous products made wholly or partly of rubber, synthetic, or substitute rubber.

All grades of channel black at all levels of sale, not previously suspended, were also removed from control. These color channel blacks are an insignificant cost in the manufacture of lacquers and paints and in making inks, OPA explained.

Then later in the month in a sweeping move OPA decontrolled a long list of products by Amendment 60. Included among the items exempt from price control are: lamp black, bicycle tires and tubes, rubber boat fenders and bumpers, rubber clothes lines, rubber dog leashes, rubber fruit jar wrenches, sponge rubber make-up puffs, rubber strip and link mats made from scrap materials, rubber tractor and implement seat cushions, rubber vacuum suction cups, sponge rubber wall cleaners, rubber druggists' sundries such as hot water bottles, ice bags, atomizers, syringes, baby supplies and rubber gloves.

Suspended from price control under the same order are: battery trays, metal tire valves, pressure-sensitive paper tape.

Among other items suspended from price control are: imported elastic fabrics (SO 184); shower curtains and shower curtain sets and home canning closures (SO 126).

Last month the following new interpretation was made of section 16 (b) of SO 129:

"*Rubber footwear.* Section 16 (b) of Supplementary Order 129, as amended by Amendment 46, decontrols rubber footwear. Rubber footwear, as used therein, means footwear in which the rubber bottoms are attached to the uppers by a vulcanizing process and includes canvas and casual footwear as well as waterproof rubber footwear in which the bottoms and uppers are attached by such process. If the rubber bottoms are attached to the uppers by any method other than by a vulcanizing process, such footwear is not rubber footwear within the meaning of Amendment 46 and consequently is not decontrolled."

Tire Dealers Convention

The National Association of Independent Tire Dealers held its twenty-sixth annual convention October 14 to 16 at the Biltmore Hotel, Los Angeles, Calif. A registration of about 3,000 was recorded, according to Clair V. Ward, general chairman of convention arrangements and a director of the Association. In addition to daily technical sessions, the program included nomination and election of board members, daily luncheons, committee reports, and special evening events culminating in the annual banquet on October 16 at which William M. Jeffers, former rubber director, was guest speaker.

John Street, director of research and development of the Office of Rubber Reserve, presented a paper on "Rubber—Synthetic and Natural" during the technical sessions. Dr. Street gave a general review of the wartime role of synthetic rubber and the postwar increases in percentages of natural rubber used to its present ratio of 32%. In 1947 the ratio of crude to synthetic will be allowed to increase to an average of 50%, and the speaker estimated that the ratio will be about two parts of crude to one part of synthetic by the end of 1947. Dr. Street spoke favorably of the present synthetic rubber passenger tire, as compared with the prewar natural tire, but emphasized that the use of appreciable amounts of synthetic in truck tires is not contemplated, unless warranted by further development work. He voiced the speculation that modifications of general-purpose synthetics might be developed that will prove superior for use in certain compounds, such as tread stocks, upon relaxation of the controls on the synthetic rubber program.

V. L. Smithers, president of V. L. Smithers Laboratories, spoke on "Rubber and Electronics." The first part of his paper was a review of the history of rubber, with emphasis placed on three milestones: the discovery of sulfur vulcanization, the discovery of nitrogen-bearing organic accelerators, and the more recent use of electronics in vulcanization. He gave examples of high-frequency vulcanization and reviewed its present use in producing foamed latex products. Although some tires have been electronically vulcanized experimentally, it is not as yet feasible for commercial production although progress is being made in research under way on this problem. Application of electronic heating to tire recapping is not recommended at present, owing to high cost of equipment and relative difficulty in its operation.

William G. Luttge, sales manager of the viscose yarn division of American Viscose Corp., spoke on "Rayon and Its Use in Tires." The speaker gave a comprehensive outline of the steps in the production of rayon tire cord and discussed its advantages on the basis of tests conducted. He emphasized that, besides technical advantages, rayon also has important economic factors contributing to its superiority over cotton. These factors include consistent quality and price stability, in addition to lower cost.

"Cotton Tire Cord—Present and Future Use in Tires," was the title of a paper presented by Mason DuPre, Jr., special assistant to the director of the Southern Regional Research Laboratory, United States Department of Agriculture. After a review of the development and history of cotton cord for use in tires, Mr. DuPre cited results of tests showing improvement in tire performance obtainable by use of cord made from certain selected varieties. While expressing belief in further improvements in cotton tire cord, acknowledged that the economic factors entering into the controversy over cotton *versus* rayon cords are such as to permit no definite answer as yet to the question of the extent of future use of cotton cord in tires.

In the elections held on the opening day of the convention, Charles R. Thebaut, Jr., was elected president of the Association for one year and also chosen as a director for a three-year term. Mr. Ward was elected first vice president, and Louis Duffy, second vice president. Mr. Thebaut appointed the following as members of the executive committee: Robert A. Dean, Ray Grimshaw, Ken R. Schael, G. H. Ballentine, L. E. Marlowe, and L. P. Sanders. In addition to Mr. Thebaut, other directors elected were: Earl Stowe, Dean Zook, Louis Voigt, W. M. Simpson, A. H. Perlman, Quinton Johnson, J. W. Martin, Edward Hogan, Ken Allen, H. E. Leonard, Thomas Wilson, C. E. McCague, T. P. McDermott, Ray Grimshaw, John Daniels, I. R. Morrison, R. B. Nelson, H. O. Stenzel, E. L. Shelbaer, Bernie Harper, Frank O'Toole, P. R. Chevalier, and Ralph Menente.

The Flintkote Co., Inc., 30 Rockefeller Plaza, New York 20, N. Y., through President I. J. Harvey, Jr., at the last directors' meeting announced the sale of the company's interest in Dispersions Process, Inc., to the United States Rubber Co., both of New York.

EASTERN AND SOUTHERN

Photographs of the SRF Black Pellets before Leaving Tank Car (Left), and just before Entering the Banbury (Right), Show no Deterioration Caused by the Receiving and Handling Installations

First Bulk Shipment of SRF Black Pellets

The first completely satisfactory delivery of SRF pellets through bulk handling facilities to a mill room Banbury was accomplished on September 4 at Jeannette, Pa. Handling of SRF black in bulk from "furnace to Banbury" has long been an industry goal. Through the collaborative development work of Pennsylvania Rubber Co., the Cabot Carbon Co., and the General Atlas Carbon Co., this goal was reached in a demonstration completed with no difficulty whatsoever, according to P. C. Mathewson, Pennsylvania Rubber vice president in charge of operations. The quality of the pellets was that which is regularly available at Cabot and General Atlas plants, handled through regular plant conveying and bulk loading facilities, and a standard freight car was used, identical with those used for shipping channel blacks.

The Pennsylvania receiving installation is a skillfully designed combination belt conveyer-bucket elevator system. A conveyer delivers black from the three outlets underneath the car to a short cross-conveyer which carries it to the boot of an 80-foot continuous bucket elevator. The elevator delivers the black to a third belt conveyer, which discharges into a bulk storage tank on the top of the building. This tank, 31 feet high and 24 feet in diameter, is partitioned for simultaneous storage of two grades of black. Totally enclosed belt conveyers on the roof transport the material distances of from 40 to 60 feet from the storage tank to appropriate points above three Banburys to which delivery is made by gravity through surge tanks and weigh hoppers.

The Pennsylvania Rubber engineering staff supervised unloading of the car, and three Cabot men, headed by B. A. Wilkes of the sales and service department, and including Stuart Stoddard, of the Cabot Texas development division, were on hand as observers. Frequent tests were made of possible pellet deterioration during the journey from the car through the bulk receiving facilities, with no significant breakdown being noted. The capacity of the installation to operate automatically and smoothly over a wide range of unloading rates was clearly demonstrated, and the entire 85,000 pounds of Sterling S were delivered with nothing more than intentional interruptions.

The initiation of bulk shipment of furnace black has been delayed for three reasons: first, the inherent difficulty in pelletizing furnace blacks so as to insure sufficient strength to withstand such shipment; second, the unsuitability of many present bulk receiving installations for handling even properly pelletized furnace blacks; and thirdly, the critical shortage of tank cars for moving channel blacks to presently installed receiving facilities. Wholesale movement of furnace black in bulk, and especially the provision of special bulk receiving equipment, is not feasible until additional tank cars which have long been on order are delivered. This experience then is significant only because it demonstrates that this difficult job can and will be done when conditions are satisfactory.

Bakelite Corp., unit of Union Carbide & Carbon Corp., 300 Madison Ave., New York 17, N. Y., has announced the granting of a license by CPA to start construction on recently acquired property at Ottawa, Ill. Work began last month, with J. G. Mulcaha resident engineer for Bakelite. About 450 people, approximately 415 men and 35 women, will be employed initially when the plant is completed, with only a skeleton supervisory staff experienced in the production of Vinylite plastics to come from the company's Bound Brook, N. J., plant. When construction is completed, probably some time in mid-1947, the plant will be operated on a year-round 24-hour daily schedule. The plant, on a 120-acre tract bordered by an arterial highway, is on the site acquired from the RFC which, during the war, was constructing a truck tire manufacturing plant to be operated by Inland Rubber Co. While little construction work has been done to date above ground, many foundations are complete, and adequate supplies of structural steel are already on the site. The manufacturing building will cover 135,000 square feet of ground and will include six bays for the production of Vinylite plastic films and sheetings, and one complete pressing unit for the production of Vinylite plastic rigid sheeting. The building will also include warehouses, offices, and a modern cafeteria.

The primary vinyl resins will be produced by Carbide & Carbon Chemicals Corp., another unit of Union Carbide, in South Charleston, W. Va., and shipped to the Ottawa plant for further processing. Key personnel have already been chosen to head up plant operations. These personnel, designated from the Bound Brook plant, include: A. B. Dickinson, superintendent; J. A. Bruton, assistant superintendent; J. E. C. Valentin, works engineer; W. O. Ackerman, in charge of the manufacturing office; and J. H. Haynes, head of the works laboratory.

Hewitt Rubber, Buffalo, N. Y., has appointed the Knight Manufacturing & Supply Co. new distributer of its mechanical rubber products in Tulsa, Okla. Principal items are transmission and conveyer belting and all types of industrial hose. The new distributership is headed by Frank Monahan and Dean Knight, who for many years have specialized in the engineering and installation of belts and hose for industry. Besides Hewitt products, the Knight Co. handles many other equipment items required in the oil fields. To provide the best in sales & service assistance, the company has moved to a new location at 923 E. Fourth St. in Tulsa.

General View of Pennsylvania Rubber Plant with Tank Car Ready for Unloading: Vertical Bucket System Is in Center, and Vertical Belt-System Conveyer to Weigh Hoppers Is Shown at Right

Calco Appointments

The pigment department of the Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J., has named Wendell G. Beauchamp, Pacific Coast regional sales manager, and John B. Fried a Metropolitan New York district sales representative.

Mr. Beauchamp, formerly superintendent of the Pacific Paint & Varnish Co., Berkeley, Calif., was associated with the United Color & Pigment Co., Newark, N. J., in 1937 as its Pacific Coast district sales manager. He was transferred to the Newark office in 1943 as an assistant sales manager of United Color and since 1944 of the Color pigment department, after the purchase of United Color by American Cyanamid.

Mr. Fried, a graduate of Ohio State University, was associated with the United Color & Pigment Co., Newark, N. J., as a chemist in 1933, but in 1934 joined the Glidden Co., as a salesman in the Metropolitan New York and Philadelphia territory. In 1942, he was assigned to the Chemical Warfare Service, U.S.A., and spent 32 months in the overseas service as a chemist in the only chemical laboratory company in the Mediterranean theatre. Mr. Fried is also a member of the American Chemical Society, Phi Beta Kappa, Sigma Xi, and Alpha Epsilon Pi.

J. Pfister, manager of the dyestuff department, at Calco, also announced two changes.

M. H. Mettee III, formerly a New England sales representative, has been transferred to plastic sales for the dyestuff department. Mr. Mettee, who was graduated from Johns Hopkins University with a B.S. degree in 1932, came to Calco as a member of the first student training class and in October, 1934, was transferred to the Boston office as a sales representative.

George A. Jonic has been made a sales representative in the Metropolitan District sales department, calling upon the textile trade in the Paterson-Passaic territory. Mr. Jonic was graduated from Carnegie Institute of Technology in 1937 with a B.S. degree in chemical engineering and also came to Calco as a student trainee. After working in the various manufacturing departments and laboratories of the company, Mr. Jonic was transferred to the Chicago sales office. He served with the 112th Engineer Combat Battalion and later with the Engineer Section of First Army Headquarters, in the European sector during the late war.

According to S. C. Moody, vice president and general manager of Calco Chemical, Horace D. Acaster has been assigned to the newly created office of manager of industrial relations of the Calco organization. Mr. Acaster studied chemistry at Cooper Union and business administration at Rutgers University. He was associated for some years with the former E. C. Klipstein & Co., South Charleston, W. Va., and later as plant manager with the Atlantic Dyestuff Co. He came to Calco in 1926 as a production supervisor. Mr. Acaster has undertaken several important assignments for American Cyanamid Co. and its subsidiaries. He spent several years in South Africa, constructing and operating a plant for American Cyanamid, he was made project engineer of the Chemical Construction Co., an American Cyanamid subsidiary, after his return to this country in 1942 and since 1943 has been plant manager of the Stamford Laboratories.

Mr. Moody, in announcing Mr. Acaster's appointment, stated: "The rapid expansion of plant facilities has created for us added social responsibilities to the employes and to the communities in which our plants are located. Maintenance of sound human relations within our organization is in the public interest and if we are to keep abreast of the new and far-reaching world developments in the chemical industry, our employes must have our assistance in the advancement of their technical skills. Mr. Acaster is eminently qualified by experience to undertake this vitally important task."

New Sales and Technical Service

The formation, on October 1, of a new company, Webber & Smith, at 52 Vanderbilt Ave., New York 17, N. Y., specializing in pigment and chemical sales and technical service was announced last month by Robert I. Webber and Holland W. Smith, Jr.

Mr. Webber, after completing voluntary service in World War I, augmented his formal education with three years' experience in the lead and zinc pigment manufacturing division of the Eagle-Picher Lead Co. After four years' sales service there he resigned to become eastern manager of the Evans Lead Corp. in New York. During the recent war years Mr. Webber supplemented his lead oxide service—which he expects to continue—with the sale of products manufactured by Thompson-Weinman & Co., and the Chemical Products Corp.

Holland W. Smith, Jr.

Robert I. Webber

Mr. Smith, a native of Georgia, was educated at Darlington School and Georgia School of Technology. Then he entered the mining and production division of Thompson-Weinman. Following this practical experience in pigment production, he obtained a leave of absence to spend a few years in the paint industry. Later Mr. Smith came to New York with Thompson-Weinman and has been active in product development, technical service, and sales in the Metropolitan Area.

Mr. Webber and Mr. Smith are well-known in the Metropolitan Area and as Webber & Smith, will continue the sale of Atomite, Lesamite, and other Thompson-Weinman extenders, maintaining the same type of service which the partners, as individuals, have offered. Additional pigments and chemicals will be handled as well. The formation of this new company was brought about so that the organizers might better serve their customers and friends through these enlarged activities.

Stein, Hall & Co., Inc., 285 Madison Ave., New York, N. Y., importer and manufacturer, and distributer of industrial commodities, will import and distribute crude rubber when the government returns it to industrial channels. Its rubber department will be under the management of Donald V. Brandon, who has had many years' experience with this commodity.

Stein, Hall has been in business since 1866 as an importer of tapioca flour, burlap, sisal, palm oil, tea, natural gums, and other commodities. It is a distributer of these as well as other domestic products which it either manufactures in its various plants or obtains from suppliers. The company maintains head offices in New York, with branches in 14 strategically located cities staffed with salesmen who serve the surrounding territory. Canadian sales are made through Stein, Hall, Ltd., Toronto, Ont., and its branch office in Montreal. Another subsidiary corporation, N. V. The Hall Trading Corp. "Rotterdam," Rotterdam, Holland, has branch offices in Batavia and Sourabaya, Java.

Durez Plastics & Chemicals, Inc., North Tonawanda, N. Y., has changed its name of the oil soluble resin division to protective coating resins division and the name of its technical sales division to industrial resins divisions, in order to define more clearly the functions of the two departments.

Also announced was the appointment of J. F. Ortner and M. J. Dubenitz as sales engineers in the industrial resins division. Mr. Ortner, with headquarters at the firm's New York offices, 250 Park Ave., will cover the Metropolitan Area, northern New Jersey, and New England. Southern New Jersey, southern Pennsylvania, Delaware, and Maryland will be serviced by Mr. Dubenitz, whose headquarters will be at the main offices in North Tonawanda.

Vila Advanced; Other U. S. Rubber Developments

George R. Vila, formerly assistant development manager, Naugatuck Chemical division, United States Rubber Co., has been appointed sales manager for latex, rubber dispersions, and plastic products, according to R. E. Casey, general sales manager for the division. Mr. Vila will make his headquarters at the division's plant in Naugatuck, Conn., but will also maintain an office at the company's general offices, 1230 Avenue of the Americas, New York, N. Y.

Mr. Vila has had ten years' experience in the production, sales, and research phases of synthetic rubber, chemical and plastics manufacture. He joined Naugatuck Chemical in 1936 as a technical sales representative, specializing in rubber chemicals. In 1942 he was transferred for work in synthetic rubber research and in 1943 became technical coordinator for the company's synthetic rubber division in charge of research, development, and quality control. In late 1945, Mr. Vila went to Germany to investigate German research and production methods in the synthetic rubber field as a member of a research group sponsored by the Office of Rubber Reserve and composed of representatives from the four largest companies. He became assistant development manager for the company's chemical and synthetic rubber divisions in January, 1946.

Mr. Vila received his A.B. degree in chemistry from Wesleyan University and his Master of Science degree in chemical engineering from the Massachusetts Institute of Technology. He was born in Philadelphia in 1909.

Travis W. Brasfield has been appointed sales manager for agricultural chemicals. He will be in touch with development work at the company's research laboratories at Bethany, Conn., and production at the chemical plant at Naugatuck.

Born in Midland, Ark., Dr. Brasfield attended local schools and received a B.A. degree at the University of Arkansas in 1934. He then specialized in mycology and plant pathology, receiving his M.S. degree at University of Iowa in 1936 and Ph.D. degree in 1938. Dr. Brasfield in 1938 was made head of the biology department of Perkinston Junior College, Perkinston, Miss., and taught biology and allied subjects until, as a Reserve officer, he was called to active service in 1940.

Mrs. Alice C. Smith, wife of Herbert E. Smith, president of U. S. Rubber, died at her home in New York on October 13. Besides her husband she leaves a daughter and two sons.

Reports on Safety

Test drivers and other personnel of U. S. Rubber's tire test fleet have been commended by Governor Sidney P. Osborn of Arizona for their highway safety record and cooperation with state traffic safety agencies. The test fleet's safety record has been maintained while vehicles were run at high speeds and in all kinds of weather on highway and off-the-road locations, reported Richard Beresford, one of the test fleet's supervisors. Tire scientists report that the Arizona desert's extremely high summer temperatures have made the location ideal for tire tread and carcass tests. In addition to the special tests in Arizona and California, the company also tests tires throughout the year at its Detroit plant, and on trucks, buses, and automobiles in practically every section of the country. Each year the company tests about 10,000 tires on the road and on various testing machines, with the total mileage on these tires as a rule usually exceeding 100,000,000 miles.

Pach Bros.

George R. Vila

Seventy members of U. S. Rubber, including several executives from the New York office and representatives of the company's plants from coast to coast, attended the company's safety conference banquet at the New York Athletic Club on September 18. The meeting was in charge of E. W. Beck, the company's supervisor of safety. Highlighting the program was the presentation of a Safe Driver award to Charles Heitzmann, executive assistant to the company president, who had driven his car for 34 years without an accident. An award of a Certificate of Appreciation for Exceptional Service in Accident Prevention was also presented to Eric Burkman, company secretary. Speaker of the evening was Capt. A. A. Nichoson, of the Texas Co., who was introduced by C. S. Ching, director of industrial and public relations for U. S. Rubber.

Captain Nichoson's subject was "The What—the Why—and the How of Safety." He stated that U. S. Rubber's safety record portrayed more clearly than any words its contribution to the unending problems of accident prevention. Safety, said the speaker, like all social problems, is a human problem and is not simply a matter of guards and goggles and gadgets, but rather a state of mind. Captain Nichoson emphasized that management was responsible for the safety plans and policies, that the safety division and line supervision were responsible for their interpretation, and that labor was responsible for their application. When these three parties recognize their responsibilities and demonstrate their willingness to discharge those responsibilities, we shall not only have better safety records, but also more efficient industrial organizations and better balanced and happier communities.

New Products Announced

A new elastic fabric without rubber has been developed by the company's textile laboratories, the elasticity being achieved by twisting cotton yarn into the shape of a coil spring. Known as Strex, the new fabric can be made in various degrees of elongation, with a maximum of 100%. It will, it is claimed, withstand repeated laundering or dry cleaning. Uses so far developed include slipcovers, gloves, sweaters, and surgical bandages. It is not intended for use in girdles or similar garments, having a lower degree of tension than Lastex. Production will be limited at first because of the shortage of textiles, manpower, and equipment.

Although increasingly useful in Strex, in Ustex, a chemically treated cotton yarn possessing 70% more strength than regular yarn, and in Carosel, a dish towel fabric possessing high absorbency and polishing characteristics, cotton is rapidly losing ground to rayon in the tire cord field. Cotton will soon be doomed as a tire cord fabric unless the price is drastically reduced to meet competition from rayon, according to H. Gordon Smith, vice president and general manager of U. S. Rubber's textile division. He pointed out that it takes more cotton than rayon to build a tire; therefore the pound cost of cotton cord would have to drop much below that of rayon cord before it could compete with the synthetic fiber on a price basis. Tires represent about two-thirds of the rubber industry's total production. The other third consists of many articles which contain a high percentage of cotton, and there is no disposition to switch to another textile. Moreover all tires are built with cotton chafer fabric, with an estimated 50 million pounds of cotton being used per year for this purpose by the tire industry. Last year U. S. Rubber purchased more than $27 million worth of cotton, and 1946 purchases are expected to equal that figure. The rubber industry in the future will need great quantities of cotton even if its use in tire cord fabric is entirely discontinued, said Mr. Smith, and the quality will be improved through research, and more new uses developed.

Lighter weight, increased flexibility, and greater softness are achieved in a new oil and gasoline hose developed by U. S. Rubber for use in unloading oil trucks and tank cars. The hose carcass consists of two plies of Ustex, a chemically treated textile said to be 70% stronger than conventional cotton yarn which formerly required three plies. The hose is lined with a synthetic rubber compound which resists aromatics and high octane fuels. Because of reduced outside diameter, standard-size couplings may be used on the new hose; whereas oversize couplings were required on the three-ply construction.

Because of the current copper shortage, the company announced that it will substitute aluminum for copper in some of its building wire and cable now going into production. The insulated aluminum wire will be made in all sizes, as approved by Underwriters' Laboratories. Aluminum has high electrical conductivity, light weight, and adequate flexibility, according to H. H. Weber, sales manager of the company's wire and cable department. He also stated that through intensified laboratory research the company has developed aluminum wire with the same overall diameter as equivalent copper sizes. Since aluminum is in plentiful supply, it is expected that this move will ease the wire shortage resulting from the temporary scarcity of copper and thus remove one of the obstacles to building construction.

John H. Dillon has resigned his position as assistant director of research of the chemical and physical research laboratories of the Firestone Tire & Rubber Co., Akron, O., to accept the positions of director of research for the Textile Research Institute and the Textile Foundation, 10 E. 40th St., New York 16, N. Y. Dr. Dillon moved from Akron to Princeton, N. J., on October 1, to take up his new duties. He had been with Firestone since 1931, since 1937 in charge of the physics research division and since 1945 assistant director of the chemical and physical research laboratories. In addition to his research on the physical properties of rubber-like materials, Dr. Dillon, while at the Firestone company, did extensive work on textile fibers from the standpoint of tire cord interest.

All the research at the Institute and the Foundation will be under Dr. Dillon. Research at the Institute has been directed by Professor Whitwell, professor of engineering chemistry at Princeton University, who will continue to administer research of the institute in the applied or engineering field. Until just recently research at the Foundation was directed part time by Dr. Henry Eyring, professor of chemistry at Princeton, who has since become Dean of the Graduate School at the University of Utah.

General Electric Co., Schenectady, N. Y., has appointed Lawrence L. Jones superintendent of its new factory for the manufacture of Glyptal alkyd resins at Anaheim, Calif. The factory, a unit of GE's chemical department, is expected to start production before the end of the year. It will comprise 35,000 square feet consisting of a process building, storage building, two pump houses, and a boiler house.

Mr. Jones, now at Anaheim, formerly had been at Schenectady where he had served as a foreman in the varnish section of the resin and insulation division of the company since 1935. Upon graduation from Colgate University in 1928 with a B.S. degree in chemistry, Mr. Jones joined General Electric in Schenectady, where he was associated with the works laboratory. He was transferred to the varnish section in 1933.

John A. Buckley, formerly of the General Electric lamp department of Nela Park, Cleveland, O., has been made merchandise sales manager for the company's chemical department at Pittsfield, Mass., according to Donald S. McKenzie, general sales manager of the department. Mr. Buckley, who will be responsible for the sale of consumer goods items, will make his headquarters at Pittsfield. Mr. Buckley was associated with the sales division of the lamp department during the greater part of his career with GE which began in 1935. He is a graduate of Ohio State University with a B.S. in industrial engineering.

Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N. J., has appointed E. L. Alderson field engineer, oil field rubber products. As such, he will cover all the oil fields of the country, with local headquarters at Houston, Tex., but operating from and as part of Manhattan's product engineering department at the executive offices at Passaic. Mr. Alderson served for many years as the company's sales representative in the Texas and Gulf Coast areas.

RMA Wins Award

The public relations program undertaken by The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y., in 1945-46, in an effort to keep the public informed of developments in rubber received national recognition in October when it was voted the annual Distinguished Service Award of the American Trade Association Executives. Of the 23 large national associations competing for the award, several received honorable mentions, including the American Meat Institute, the Association of American Soap and Glycerin Producers, and the Automobile Manufacturers Association.

The setting up of a public relations program was authorized by RMA directors in January, 1945, with a staff under the direction of President A. L. Viles. Achievement of the program's objective was sought through the following nine channels: pamphlets on the industry; issuing factual press releases and holding press conferences and interviews; direct participation of staff members in nationwide radio programs; writing feature stories for general circulation magazines; establishing an information library for the service press, radio, writers, students, researchers, and the industry; issuing an expanded bulletin service to members to keep the industry informed; developing a special veterans' readjustment program to supplement individual company activities, which have led to the employment of more than 90,000 veterans; publishing regularly reviews of employe relations publicity within the industry; and by special publicity jobs for the various manufacturing divisions of the Association.

War Assets Administration, Washington, D. C., in its recent listings of surplus goods for sale included: 100,000 pairs of Navy all-rubber seaboots; 3,400,000 pairs of black rubber composition half-soles; 20,000 pairs of men's arch supports; telephone wire and cable and related items; industrial chemicals.

Office of International Trade, United States Department of Commerce, Washington 25, D. C., according to "Current Export Bulletin No. 366," requires that the copper content of certain products, including rubber covered and weatherproof wire, must be shown when a license is applied for to export the commodities. The bulletin further reveals that the following items, among others, have been removed from the Positive List and placed on general license for exportation to destinations in Group K: coated cotton fabrics more than 12 inches wide; pyroxylin coated or impregnated cotton base fabrics more than 12 inches wide; and coated or impregnated cotton fabrics more than 12 inches wide, except varnished cambric, which remains on the Positive List. Also covered is the establishment of a consolidated license for the exportation of certain chemicals and coated fabrics to Group K countries.

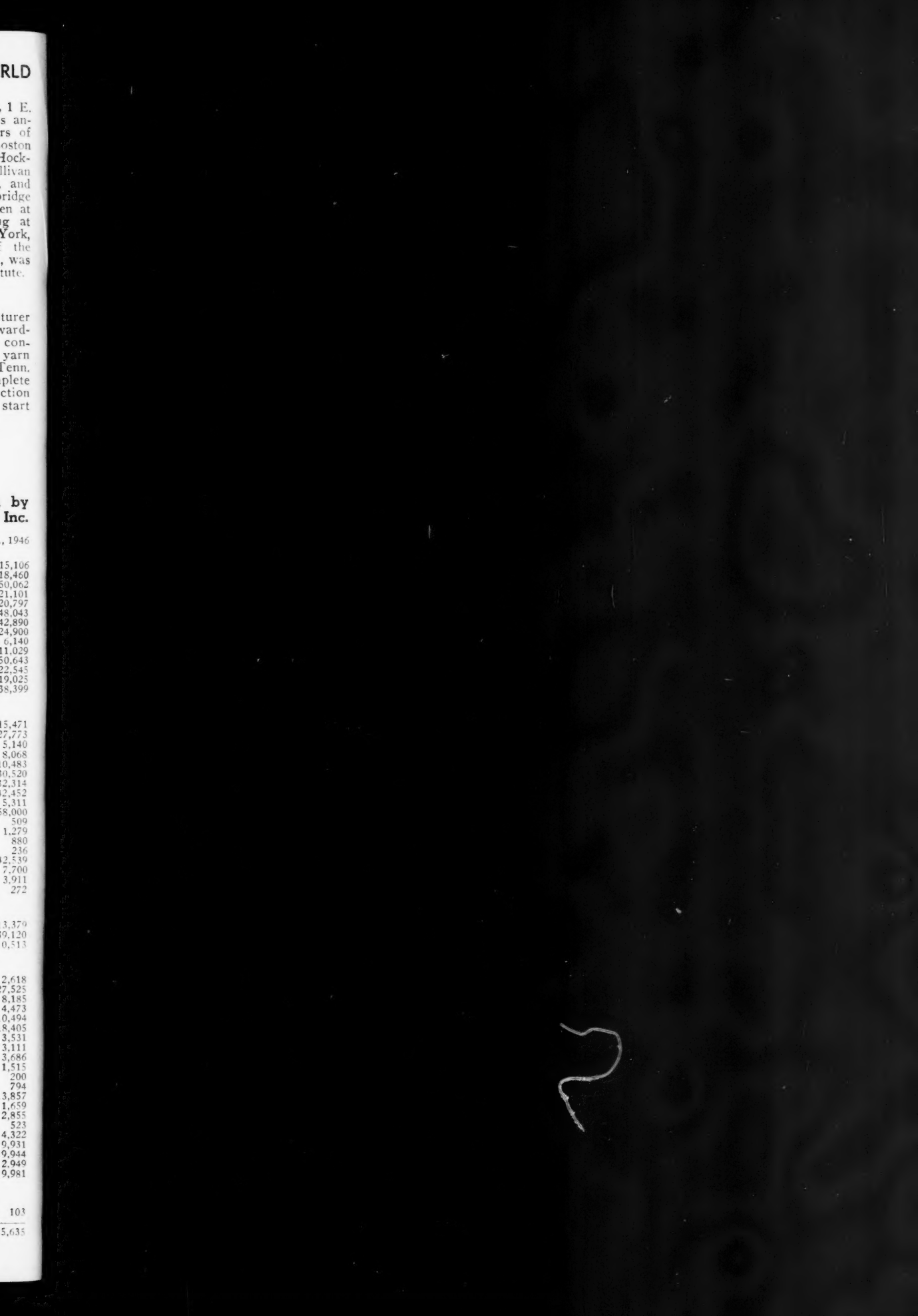
"Current Export Bulletin No. 371," October 16th, contains details clarifying and amending the British Token Import Plan. Included is a list of commodities added to others already subject to the plan. Among the items mentioned are: bathing caps, athletes' supporters, rubber bands, erasers, and hot water bottles.

Controllers Institute of America, 1 E. 42nd St., New York 17, N. Y., has announced the reelections as directors of the District of Columbia and the Boston controls, respectively, of P. L. Hockman, assistant treasurer of O'Sullivan Rubber Corp., Winchester, W. V., and of Frederick L. Patton, of Cambridge Rubber Co., Cambridge, Mass. Then at its recent fifteenth annual meeting at the Hotel Commodore, New York, Homer E. Ludwick, controller of the Firestone Tire & Rubber Co., Akron, was chosen a vice president of the Institute.

American Enka Corp., manufacturer of rayon yarns, Enka, N. C., has awarded contracts for engineering and construction of a new rayon tire yarn plant, to be located at Lowland, Tenn. The plant will consist of a complete new production unit, and construction at the plant site is expected to start immediately.

Rims Approved and Branded by The Tire & Rim Association, Inc.

Rim Size	Sept., 1946
15" & 16" D. C. Passenger	
15x4.00E	15,106
16x4.00E	418,460
16x4.50E	250,062
15x5.00E	121,101
16x5.00F	20,797
15x5.50F	48,043
16x4.00E—Hump	242,890
15x4.50E—Hump	24,900
16x4.50E—Hump	6,140
15x5.00F—Hump	11,029
15x5-K	50,643
16x5-K	122,545
16x6-L	119,025
15x6½-L	38,399
Flat Base Truck	
17x4.33R	15,471
20x4.33R	27,773
15x5.00S	5,140
17x5.0	8,068
18x5.00S	10,483
20x5.0	30,520
20x5.00S	232,314
20x6.0	42,452
20x6.00S	5,311
20x6.00T	58,000
22x6.00T	509
24x6.00T	1,279
15x7.33V	880
18x7.33V	236
20x7.33V	42,539
22x7.33V	7,700
24x7.33V	3,911
20x8.37V	272
Semi D.C. Truck	
15x5.50F	13,379
16x5.50F	39,120
16x6.50H	10,513
Tractor & Implement	
12x2.50C	2,618
12x3.00D	27,525
15x3.00D	8,185
16x3.00D	4,473
18x3.00D	10,494
19x3.00D	18,405
20x4.50E	3,531
15x3.75T	3,111
24x8.00T	3,686
28x8.00T	1,515
36x8.00T	200
40x8.00T	794
W8-24	13,857
W9-28	1,659
W10-28	2,855
W10-38	523
DW9-38	4,322
DW10-38	9,931
DW11-28	9,944
DW11-36	2,949
DW11-38	9,981
Earth Mover	
24x15.00	103
Total	2,185,635



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Better Curing
Better Aging
Better Detrition
Better Tire Life

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BINNEY & SMITH CO. DISTRIBUTOR

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THE HIGH RESILIENCE SRF CARBON

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STATEX-93 *The carbon for heavy-duty reinforcement*

MICRONEX *For 30 years the standard reinforcing carbon*

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MANUFACTURER

BINNEY & SMITH CO.
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OHIO

New Financing Approved

The stockholders of The Faultless Rubber Co., Ashland at their annual Meeting on September 27 adopted amended articles of incorporation changing the present common stock without par value into common stock with the par value of $1 per share and splitting each share of the present stock into two shares of the new $1 par value common stock.

Application has been made to list the new common stock for trading upon the Cleveland Stock Exchange, and it was expected that the stock split up would become effective and trading will start in the new stock about October 1.

All present directors were re-elected at the meeting.

At the organization meeting of the board held immediately following the shareholders' meeting, the following officers were elected: Wallace De Laney, chairman of the board and president; T. W. Miller, Jr., first vice-president; Geo. A. Meiler, secretary and treasurer; Z. T. Wile, assistant treasurer; R. C. Johnson, assistant secretary.

The Faultless Rubber Co. amended its articles of incorporation at the shareholders' meeting on September 27 to broaden its purpose and permit the company to enter the general plastics field if and when it should seem advisable to do so. Mr. De Laney states, however, that there are no immediate plans to enter into the manufacture of plastics.

New H-P-M Executives

The Hydraulic Press Mfg. Co., Mount Gilead, has appointed Fred C. Ziesenheim sales manager of its plastics and die casting machinery divisions. His duties will be to direct the sales and assist in the development of new machines for these two important divisions of the H-P-M company. Mr. Ziesenheim is a graduate engineer, having received his M. E. degree from Carnegie Institute of Technology. For five years Mr. Ziesenheim was part owner and manager of plants manufacturing die cast toys, and for the past six years he was associated with a well-known manufacturer of plastics molding and die casting machines, as sales and advertising manager.

The H-P-M company is adding several new models to its present line of metal die casting machines. As a pioneer builder of plastics molding machinery, the H-P-M company also is building several new production units to meet the needs of the fast-growing plastics industry. Mr. Ziesenheim's technical and practical experience highly qualifies him as an expert in solving application engineering problems. His thorough understanding of actual production requirements will be of great assistance to manufacturers planning to enter these two particular fields of industry.

Then later in the month Hydraulic Press announced the appointment of Robert F. Ohmer as vice president in charge of administration. Prior to being called to active service in the army in 1942, Mr. Ohmer was president of Commonwealth Engineering Co., of Ohio, a firm specializing in industrial research and development. Mr. Ohmer's previous experience included the management of

Robert F. Ohmer

Fred C. Ziesenheim

a well-known firm designing and producing bank fixtures and interior construction of public buildings. Mr. Ohmer is also a veteran of World War I.

Materials Handling Exposition

The National Materials Handling Exposition, the first to deal entirely with this industrial problem, representing approximately one-quarter of all costs, will be held at the Public Auditorium, Cleveland, January 14 through 17, 1947. A four-day program of prepared papers and discussions will be held concurrently with the exposition. This series will feature materials handling specialists from many fields, including rubber and chemicals. On display at the exposition will be hoists, hoist mountings, cranes, derricks, conveyers, hand and power trucks, skids and pallets, tractors and trailers. Edwin J. Heimer, president of Barrett-Cravens Co., is chairman of the exposition committee, and Ezra W. Clark, vice president and general manager of Clark Tructractor division of Clark Equipment Co., is chairman of the program committee. Earl I. Burke, manager of shipping for Republic Steel and chairman of the packaging and loading committee of the American, Iron & Steel Institute, is chairman of the exposition's policy committee. Clapp & Poliak, Inc., of New York, will manage the exposition.

Firestone Announcements

Firestone Tire & Rubber Co., Akron on November 1 will redeem at 100¾ through a sinking fund $625,000 of 3% debentures due May 1, 1961.

Harvey S. Firestone, Jr., president of the Firestone company, at the recent banquet held in New York commemorating the one-hundredth anniversary of the independence of the Republic of Liberia, announced a gift of $250,000 for a new Institute for Research in Tropical Medicine to be established in Liberia. He described the donation both as a memorial to his father, founder of the Firestone company, and as a contribution to the republic's centennial program. Mr. Firestone also reported that in 1945, Liberia shipped more than 43 million pounds of natural rubber. Also attending the affair was Ross E. Wilson, general manager of Firestone Plantations Co.

A Navy Certificate of Achievement has been presented to Mr. Firestone by Rear Admiral Monroe Kelly, USN, Commandant of the Third Naval District at his headquarters at 90 Church St., New York, N. Y., who included the following remarks in connection with the presentation:

"The United States Navy ever mindful of the highest welfare of its personnel is especially grateful to The Firestone Tire & Rubber Co., for its vision and generosity in sharing in the Navy's welfare and recreation program.

"This award by the Navy is in recognition and appreciation of the value of the series of booklets known as 'Fun en Route,' 'More Fun en Route,' and 'World O' Fun,' millions of which were made possible by The Firestone Tire & Rubber Co. and used by naval personnel on transports, landing craft, hospitals, submarines and out-of-way posts. This cooperation of The Firestone Tire & Rubber Co. with the National Recreation Association, publisher of these books, together with donations of Firestone Record Albums of classical music resulted in enriching the Navy's recreation program throughout the world."

Revival of the once-famous Glidden Tour of automobiles attracted nationwide attention during August as the horseless carriages of a quarter-century ago once again completed a 500-mile cross-country reliability run under their own power. Starting from New York and Boston on August 17, about 80 automobiles, 1904 to 1919 models, rode to Albany, Syracuse, Rochester, and Buffalo. After a two-day break for entertainment of the party by the Ford Motor Co. and General Motors Corp., the old cars were transported by lake boat to Cleveland, from which they made the last leg of their journey to the Firestone Homestead at Columbiana. In 1907 the official Glidden Tour had visited the Homestead as guest of Harvey S. Firestone, Sr. Thirty-nine years later Harvey S. Firestone, Jr., was host to this similar group of 1946 Tour enthusiasts. Chairman of the Tour was Tenor James Melton, and participants were members of the Veterans Motor Car Club of America, the Old Timers Club, and the Horseless Carriage Club.

The expedition owed much of its success to Firestone, which four months earlier had started production of old-size tires, and more than three-fourths of the cars used these new tires. Firestone executives present at the Homestead reception and dinner included John W. Thomas, honorary chairman, L. R. Jackson, executive vice president, and J. E. Trainer and H. D. Tompkins, vice presidents in charge of production and sales, respectively. Other prominent personages included Charles Chayne, chief engineer of the Buick division of General Motors; William Ford, youngest son of the late Edsel Ford; M. J. Duryea, son of the founder of the famous Duryea Motor Wagon Co.; and many others.

To speed up delivery of tires, airlines are now flying full cargo ships from Firestone's main plants in Akron. American Airlines now picks up its own aircraft tires for delivery to maintenance and repair depots. In a recent case a converted C-47 of U. S. Airlines transported 215 Firestone tires (7,000 pounds) from Akron to St. Petersburg, Fla., from where they were transshipped to Guatemala by Latin-American Airways.

Personnel Changes

Promotion of J. F. Faunce to be assistant merchandise manager at Firestone also was announced last month by Gordon V. Mead, merchandise manager. Mr. Faunce had been division merchandise manager in charge of appliances, radios, toys, and housewares. A graduate of Ohio State University, he joined the company's college training class in 1931. After serving as a store manager in the field he was assigned to the sales department in Akron in 1934, when Firestone's diversified merchandising program was inaugurated, with which he has been closely associated.

Several other major staff promotions also were announced by Mr. Mead, including:

W. J. Bertolette, division merchandise manager for batteries, spark plugs, brake lining and other automotive and aircraft supplies, has been placed in charge of appliances, radios, and housewares.

E. L. Parker, division merchandise manager for recreation supplies, wheel goods and leather goods, is now in charge of toys.

L. E. Olcott, buyer of automotive supplies, was named division merchandise manager for batteries, spark plugs, brake lining, and other automotive and aircraft supplies.

I. E. Silkey, in charge of batteries, has been promoted to automotive supplies buyer.

R. H. McGraw, former assistant buyer of automotive items, has been advanced to buyer of batteries.

New Tractor Tire

A new tractor tire that delivers tremendous pulling power even under the worst soil conditions and automatically sheds mud and litter as it rolls, also was recently announced by Mr. Firestone. With patented curved, triple-braced high traction bars that give a "center bite," the new Firestone Champion Ground Grip tire is claimed to outpull, outclean, and outlast any tire of its kind previously developed. In addition, the continuous tread design assures smoother riding.

L. R. Jackson, company executive vice president, reported that performance tests on all types of soils show that the new tire cleans up to 100% more effectively, delivers as much as 62% more pulling power, and gives up to 91% longer life than tires having straight, open-center traction bars. The tire embodies many innovations in design and construction. The wedge-shaped spaces between the curved tread bars continuously widen from the center of the tread to prevent clogging. The tread pattern is free of bar ends at the center, around which litter can wrap or clog; the tread bars are higher, and an improved cross-section design makes the tread deeper at the shoulders of the tire. Pulling power is naturally increased through the cleaning advantages of the new design, since a tread with a higher bar depth grips the soil firmly at all times. Still another advantage of the new tire is its versatility. In loose earth the deeper bars penetrate to lower, better traction areas; while in firm soils or muddy-top conditions they are forced to greater depths. On paved roads and other hard surfaces, the wider, continuous tread width provides a greater area of contact. Factors contributing to the longer life of the tire include the bars, triple-braced near the tread center to insure stability, which are up to 25% higher. Curving of the bars adds strength and reduces wiping and scuffing, and equally important, the design contains additional traction bar length ranging up to 73 inches more in the 9-24 size, which also gives greater protection to the tire body. The new tire is being made available at no increase in price.

The General Tire & Rubber Co., Akron, has appointed Edward B. Butler, former Akron newspaperman, as director of public relations, according to William O'Neil, president. Previously Mr. Butler had been for two years with the General Tire sales organization. His most recent assignment was directing dealer relations and sales promotion for the central division. Prior to taking his job with General Tire, he had served both the *Beacon Journal* and the *Times-Press*. He also conducted a news commentary program over Radio Station WADC for 14 months. Mr. Butler, 35, attended the universities of Akron, John Carroll, and Detroit, majoring in English literature and business administration.

Edward B. Butler

B. F. Goodrich Chemical Co., Rose Bldg., Cleveland, has established a new sales office in the United Shoe Machinery Co. Bldg., 140 Federal St., Boston, Mass., W. D. Lahey and J. J. Breen will be sales representatives for Geon thermoplastics in Boston and New England. Their headquarters had previously been New York, N. Y.

American-made synthetic rubbers are still being improved at a rate in keeping with the nation's best technological tradition, according to W. S. Richardson, president of Goodrich Chemical, who cited the publication of 334 United States patents last year for improvements either in these rubbers or in their product application as evidence of the work in this field. He revealed that The B. F. Goodrich Co., Akron, the parent company, was responsible for 84 of these patents. A survey of the 334 patents shows that their subjects fall into two general classes, Mr. Richardson said. One group consists of improvements in the preparation and purification of butadiene, with most of these inventions naturally coming from the laboratories of oil refiners and chemical companies concerned with its manufacture. The other group consists of inventions having to do with the actual manufacture of synthetic rubber and its use in making products, and these came principally from the rubber companies who built and operate the government rubber plants. Exactly one-half of the patents in this second category, 79 out of a total of 158, went to Goodrich, Mr. Richardson stated. The company's other five patents, he added, were on the preparation and purification of butadiene.

Seiberling Rubber Co., Akron, has appointed Douglas Mueller director of public relations; while Thomas Buchanan, in charge of public relations for the company for the past several months has been made director of publications, with responsibility for Seiberling dealer and employe newspapers and magazines. Mr. Mueller returns to Seiberling after more than two years of Army service. He joined the company in June, 1941, and was publicity manager when he left to enter service in July, 1944.

Dayton Rubber Mfg. Co., Dayton, has appointed M. H. Clarke vice president and director of manufacturing, according to A. L. Freedlander, president, who declared that this appointment to the new position is in keeping with Dayton Rubber's program of streamlining operations and supplementing the administrative staff to meet the needs of expanding business. The new vice president's duties will include responsibility for the engineering, production, laboratory, traffic, safety and plant protection divisions in all of the company's operations. Prior to joining Dayton Rubber, Mr. Clarke had been president of the Lake Shore Tire & Rubber Co., Des Moines, Iowa. A graduate of the Georgia School of Technology, he has spent many years in engineering and manufacturing activities.

Anchor Rubber Products, Inc., manufacturer of mechanical goods and screw machine products, London Rd. at Euclid Ave., Cleveland 12, has bought the building and adjoining land at 1725 London Rd. in an expansion move. Purchase price was reported in excess of $150,000.

Goodyear Expanding Gadsden Operations

A $650,000 expansion program for Goodyear Tire & Rubber Co.'s new sole and heel factory at Gadsden, Ala., which will double the output of the plant, was announced last month by A. C. Michaels, plant manager.

Goodyear's original shoe products plant was completed last fall at a cost of $750,000, bringing a brand-new manufacturing item to Alabama. Approximately 200 men and women are employed now, and this number will be increased in line with the plant's expansion.

Products include Neolite soles and heels as well as rubber heels and composition soles for dress, work, and sport shoes.

Mr. Michaels also announced that initial production is under way in the company's recently completed $4,000,000 tube manufacturing plant. This new unit, 250 feet wide and 560 feet long, will have the largest capacity of any tube manufacturing plant in the country, Mr. Michaels said. One production line is already operating, and equipment for two others is being installed. Tubes will be produced for passenger cars, trucks and farm tractors.

The current expansion program increases Goodyear's Gadsden operations to five separate manufacturing units, affording employment for nearly 4,000 men and women.

The original plant, built in 1929 and expanded several times since, is presently producing three times the former capacity of passenger and truck tires. A tractor tire factory, erected two years ago, turns out several hundred giant tires daily. A reclaiming plant was built in 1929.

Notes on Personnel

Reorganization of the Airfoam sales department of Goodyear's chemical products division to meet the great demand foreseen during 1947 for Airfoam products has been announced by C. P. Joslyn, division manager. Acting manager of the department is E. E. Ellies, assistant division manager, with W. E. Weller office operating manager. Other appointments announced are: R. M. Sourbeck, in charge of transportation and miscellaneous seating sales; J. A. Bernel, in charge of furniture and mattress sales; and John F. Chapple, field representative in Chicago. D. K. Usher will assist Mr. Sourbeck. Mr. Weller's office staff includes P. S. Heskett, James B. Wiland, R. R. Tilt, and W. F. Flower.

Prior to joining the Airfoam sales department, Mr. Weller was works accountant at Plant D, Goodyear Aircraft. He is a graduate of the University of Michigan and a native of Monte Vista, Colo.

Mr. Sourbeck, from Youngstown, O., joined Goodyear in August, 1944, after many years' with General Fireproofing, Youngstown, and Boeing Aircraft, Wichita.

Mr. Bernel has been assigned to Airfoam sales after having been affiliated with the fuel tank development. He is a native of Akron.

Mr. Chapple, of Wilmington, Del., comes to Goodyear from the Cameron Mfg. Co., Emporium, Pa., where he was plant manager.

Jack K. Lockridge, since February, 1945, plant manager of the Goodyear synthetic plant at Torrence, Calif., has been made manager of the new plastics production division, Plant B, Goodyear Aircraft. A graduate chemical engineer (University of California, 1931), he has been with the rubber company 16 years, serving in Akron and California. He is succeeded at the synthetic plant by Gordon A. Boelter, formerly production superintendent, which post now goes to Benjamin A. Rosinski, general foreman.

Cliff Slusser, who joined the company as a teen-age clerk and in 15 years became a vice president, last month rounded out 35 years with Goodyear. Completing three decades were R. A. Hamersley, shoe representative in Dallas, Tex.; and J. B. Brice, field representative at Baltimore, Md.

The important role of Pliolites in the development of synthetic rubber resins for printing inks, and their possible place in the future, were discussed recently by R. P. Dinsmore, Goodyear vice president in charge of research, speaking before the National Association of Printing Ink Makers at the Shoreham Hotel, Washington, D. C. Before the war, Pliolite, a Goodyear resin produced from natural rubber, when suspended in a high-flash solvent, proved ideal for the manufacture of quick-drying inks, so necessary in high-speed newspaper and magazine printing. Inks based on synthetic Pliolite are now available which will dry in seconds, stated Dr. Dinsmore, yet will not set up or dry upon the applicator rolls even if left unused for 24 to 48 hours. These inks give hard, scuff-resistant surfaces, can be made in a variety of colors, and may make unnecessary the expensive drying equipment now required for rapid printing. Inks from the Pliolites also hold promise for the printing of transparent films and for silk screen printing, as well as rotogravure and magazine work, Dr. Dinsmore added.

Dr. Dinsmore has been named to the Army Ordinance Association's Advisory Committee on ordnance and research. Dr. Dinsmore, who served as assistant rubber director during the war, will work with Chairman Charles F. Kettering, vice president and director of General Motors; Dr. Rufus E. Zimmerman, vice president in charge of research and technology for U. S. Steel; Dr. Oliver E. Buckley, president of the Bell Telephone Laboratories; and Clyde Williams, director of Battelle Memorial Institute. The committee, named by Col. L. A. Codd, vice president of the Association, at the request of Maj.-Gen. Everett S. Hughes, chief of ordnance, U. S. Army, will encourage and offer guidance to a continuing program of research and development of ordnance as a national defense measure, utilizing all facilities, governmental and private, for the purpose.

New Products Developed

A new-type rubber compound embodying all desirable features of prewar quality unvulcanized crude printing plate stock is now being produced by the printers' supply department of Goodyear's mechanical goods division. According to E. W. Sanders, manager of the department, the compound is highly resilient and particularly adapted to job press printing, in addition to its wide application in the box and bag printing industry.

Application of rubber, in the form of a flexible finger, to the poultry dressing industry is responsible for a machine that will "undress" as many as 5,000 chickens, turkeys, ducks, or geese per hour. Developed by Goodyear molded goods engineers, the new finger is the nucleus of a poultry dressing machine manufactured by the Natco Products Corp., Paoli, Pa. Solution to the problem of making a finger strong enough to pull out quills, yet so flexible it would not tear or bruise the tender flesh, was finally reached by molding a stiff finger in a bifurcated form. With this split finger, slotted to give it a firm, but not damaging grip, machines are defeathering fowl at the rate of one every seven-tenths of a second; while old methods required as much as 10 minutes.

Starts New Plastics Division

Creation of a new plastics production division in The B. F. Goodrich Co. and the appointment of Bert S. Taylor as factory manager were announced by T. G. Graham, vice president. Mr. Taylor had been general superintendent of the company's processing division since August 1, 1938, with the processing of plastics in the company's Akron plants under his direction. In his new post he will have charge of the new $5,000,000 plastics processing plant the company is building near Marietta, as well as other plastic production activities.

Mr. Taylor joined the company August 17, 1925, after having received his bachelor's degree in chemistry from the University of Illinois and his master's degree in the same subject from Harvard University. After several years in chemical research he was named manager of the chemical laboratories in 1928 and held that post until 1930 when he was named manager of raw materials development, where he remained until appointed general superintendent of processing eight years later.

Robert H. Wattleworth has been named general superintendent of the processing division to succeed Mr. Taylor.

Mr. Wattleworth, a graduate in mechanical engineering from the University of Michigan came to Goodrich in 1926 and a year later was transferred to the processing division as a foreman. He was made general foreman of mixing in 1928, production superintendent in 1938, and manager of processing departments in 1944.

Several changes in the merchandising organization of Goodrich's replacement tire sales division have been announced by Joseph A. Hoban, merchandise manager.

Thomas C. Yarnall, manager of sales planning for the last several years, has been named manager of store merchandising, in which capacity he will be responsible for all the merchandising programs with company-owned outlets. Mr. Yarnall, a graduate of the University of Illinois, has been with the company since 1928. He was manager of Goodrich store from 1929 to 1935, when he came to Akron headquarters as a merchandising man. Later assignments included gasoline, oil and service sales management, manager of budget sales for the company, and then manager of sales planning.

Robert Lee Reeves succeeds Mr. Yarnall as manager of sales planning. Mr. Reeves joined the company this year following nearly four years in the Navy. A graduate of Georgia Tech in business administration, he entered the rubber industry in 1930 and had held a number of executive and administrative posts.

Thomas B. Tomkinson, controller of the Goodrich company since 1927 and a director from 1928 to 1940, will retire on December 31; he had completed 43 years of continuous service with the company on August 6. He plans to live alternately in Akron and Florida. Mr. Tomkinson first worked during school vacation periods for the Diamond Rubber Co., but on August 6, 1903, at the age of 16, he joined, on a full-time basis, the company's cost department. Continuing his schooling at night and specializing in accounting, he was made head of the department five years later. Following the merger of Diamond and Goodrich in 1912, he became assistant general auditor, then in 1917, assistant controller. In 1925 he was named vice president and general manager of The B. F. Goodrich Rubber Co. of Canada, Ltd., Kitchener, Ont., and two years later was elected controller of the parent organization.

Manufacture of rubber inflatable equipment for aviation which loomed so large during the war has not ceased in Akron plants since the coming of peace. At Goodrich's Plant 4, "righting chambers" are being produced. These chambers were developed to make sure that conventional boats dropped from planes will keep afloat until they can serve their purpose as rescue vessels. One of these chambers is placed into both the bow and the stern of the boat and guarantees that it will not capsize after it reaches the sea, no matter how rough.

MIDWEST

New Plant to Produce Resins

Reichhold Chemicals, Inc., Detroit, Mich., will be producing resins at a new Seattle, Wash., plant by January 1, 1947, according to Henry Reichhold, board chairman, provided reconversion of the million-dollar charcoal plant built by the Chemical Warfare Service in 1942 and acquired by Reichhold in September from War Assets Corp. proceeds on schedule. Acquisition of this plant gives RCI a complete chemical plant, laboratories, offices, and a 16-acre site on the Duwamish River, at 5900 W. Marginal Way, Seattle, with access to ocean shipping and with rail connections.

First units of the plant will be completed as soon as possible to produce phenolic, urea, and melamine resins for the Pacific Northwest's plywood mills. Immediate production is likewise planned for "wet strength"-and coating resins for the paper industry and impregnating resins used in the manufacture of plastic-faced plywood. Resins used in the formulation of surface coating materials will also be produced. The first year's resin production at Seattle is expected to be in excess of 25 million pounds, with a minimum capacity of around two million pounds a month.

Establishing this latest plant in Seattle is in line with RCI's decentralization policy and gives Reichhold six plants located strategically throughout the country.

T. S. Hodgins, for five years RCI's Seattle district manager, will head the new plant.

C. C. Crawford

Phillips Promotes Crawford

Frank Phillips, chairman, and K. S. Adams, president of Phillips Petroleum Co., Bartlesville, Okla., recently announced the appointment of C. C. Crawford as assistant manager of the chemical products department in charge of the special products, product development, and Perco divisions. A. J. Dirksen was promoted to manager of the product development division, the position formerly held by Dr. Crawford.

In announcing the appointment it was stated, "The increase in Phillips sales and development activities for special hydrocarbons, chemicals and patent licensing has brought about the necessity for additional management assistance."

Dr. Crawford obtained his master's degree in chemistry from Emory University, Atlanta, Ga., and his Ph.D. in chemistry from Yale in 1937. He started with Phillips Petroleum in January, 1943, in the special products division, having previously been employed as a chemist with Shell Development Co. In March, 1944, he was made manager of the products development division.

Safety Council Awards

The National Safety Council, 20 N. Wacker Dr., Chicago 6, Ill., has announced final results in its 1945-46 Rubber Section safety contest. Fifty-six plants competed in the contest, with the average frequency rate for all contestants, being 9.27 lost-time accidents per million man hours worked. Five plants completed the contest without a reportable injury, and the synthetic division made the greatest reduction in frequency rates, 55% below that of the previous year. In the synthetic division, first prize, a plaque, went to the National Synthetic Rubber Corp., Louisville, Ky.; while second and third-place certificates were awarded to Canadian Synthetic Rubber Co., Ltd., Sarnia, Ont., and Copolymer Corp., Baton Rouge, La., respectively. National had a perfect record while the frequency rates for the Sarnia and the Baton Rouge companies were 1.36 and 1.41, respectively.

In the large rubber fabricating plants group a first-place plaque was awarded to Dominion Rubber Co., Ltd., St. Jerome plant (a subsidiary of United States Rubber Co.), with a perfect safety record. Second-place certificate was won by U. S. Rubber's Ball-Band plant, Mishawaka, Ind., with a 1.49 frequency rate, while the certificate for third place was awarded U. S. Rubber's Naugatuck footwear plant, whose rate was 2.51. In the smaller plants group, plaques were awarded to three U. S. Rubber plants, which tied for first place with perfect safety records. The research and technical development department, Passaic, N. J.; the Worcester, Mass. plant; and the Fabric Fire Hose Co., Sandy Hook, Conn.

At the Council's Rubber Section meeting on October 8, Roland Kastell, of U. S. Rubber, was elected general chairman. Glen D. Cross and H. L. Andrews, both of Firestone Tire & Rubber Co., were elected vice chairman in charge of program, and secretary, respectively. Other officers elected were: *News Letter* editor, Gordon Trank, of Hewitt Robins, Inc.; and staff representative, F. A. Van Atta. Committee chairman follow: engineering, George Burkhardt, General Tire & Rubber Co.; health, Dr. J. Newton Shirley, Arrow Mutual Liability Insurance Co.; membership, R. M. Boyles, Midwest Rubber Reclaiming Co.; poster, T. H. Boyd, Manhattan Rubber division of Raybestos-Manhattan, Inc.; publicity, C. E. Beck, St. Clair Rubber Co.; and statistics, M. E. Badstuber, Ohio Rubber Co.

Monsanto Advances Several

Monsanto Chemical Co., St. Louis, Mo., last month made several changes among its executive personnel.

Howard K. Nason was promoted to associate director of the Central Research department in Dayton, O., according to Carroll A. Hochwalt, Central Research director for the company. Mr. Nason, a native of Kansas City, Mo., has been with Monsanto since 1936, since 1944 as director of development of the Central Research department in Dayton. He previously had served as research chemist in the St. Louis laboratories from 1936 to 1939 and as assistant director of research of Monsanto's plastics division in Springfield, Mass., from 1939 to 1944.

Mr. Nason belongs to the American Chemical Society, Society of Rheology, New York Academy of Sciences, American Association for the Advancement of Science, the Division of High-Polymer Physics of the American Physical Society, the executive committee of the Rubber and Plastics Division of the American Society of Mechanical Engineers, The Chemists' Club of New York, and the American Society for Testing Materials.

Dr. Hochwalt also announced the appointment of Edward M. Hubbard, Milton Kosmin, and Ralph R. Wenner as group leaders at the Central Research department.

Mr. Hubbard, who received his technical education at the University of Illinois, is in charge of analytical work at Monsanto's Central research laboratories. A native of Freeport, Ill., he joined the company at St. Louis in 1939 and was transferred to Dayton in 1941.

Mr. Kosmin, a native of Chester, Pa., joined Monsanto at Dayton in 1935 after graduating from Pennsylvania State College. He has been engaged in research on several types of organic chemicals and

has been awarded a number of patents for original discoveries in this field. In his new position, he will be responsible for research work on synthetic wetting agents and detergents.

Mr. Wenner, who was born in New York, N. Y., attended Cooper Union Institute of Technology, Northwestern University, and California Institute of Technology. Before joining Monsanto at Dayton in 1942 he was engaged in chemical and engineering work for several other chemical manufacturers. His specialty is chemical engineering and process development, and he is well known for his original work in chemical thermodynamics. He will be responsible for process engineering and evaluation work at the Monsanto laboratories in Dayton.

Monsanto further announced that its Montreal, P. Q., subsidiary, Monsanto (Canada), Ltd., has begun production of polystyrene in a new plant whose output will greatly exceed Canada's prewar requirements for the widely used thermoplastic material. It is the first polystyrene plant in the British Empire. With 50% capacity now in operation, the new unit will attain full production shortly after November 1, serving both Canadian and export markets. It is a part of Monsanto's company-wide polystyrene expansion program which contemplates a total production of more than 80 million pounds a year early in 1947. The Montreal facility utilizes processes and techniques established by the company's plastics division at Springfield, Mass., and the product is the same as the company's Lustron. About 95% of the equipment in the new plant is of Canadian origin. The base material, styrene monomer, is being purchased from the Polymer Corp., Sarnia, Ont.

Lake Shore Tire & Rubber Co., Des Moines 6, Iowa, has elected R. C. Gunther executive vice president and general manager. Mr. Gunther, who has had more than 30 years' experience in the rubber industry, was formerly vice president at Lake Shore and prior to that had been general manager of Armstrong Rubber Co., West Haven, Conn.; president of Inland Rubber Corp., Chicago, Ill.; and factory manager of Mohawk Rubber Co., Akron, O.

The Okonite Co., Passaic, N. J., has placed John L. Marsh in charge of insulated wire and cable sales for the company's newly opened sales office at 417 Merchants Bank Bldg., Indianapolis 4, Ind. Mr. Marsh who recently returned from service in the U. S. Navy, was formerly with Okonite's New York office.

NEW ENGLAND

Cabot Carbon Co., Boston, Mass., has been awarded the Nash carbon black plant at Guymon, Okla., by the Real Property Disposal Board of the War Assets Administration for its bid of $550,000. Cabot was the only bidder for the plant, and the award now goes to the Department of Justice for review, as in the case of all such sales. The Nash plant was constructed during the war for the government according to plans drawn by Cabot, who acted as agent. The plant was completed in October, 1945, and since then operated by Cabot under lease from RFC. It was one of the six carbon black plants approved by WPB to meet the wartime emergency brought on by the shortage of carbon black. Nash produces carbon blacks by the channel process. It was built to manufacture 15 million pounds of channel black a year at capacity production, but under Cabot operation the output has been at the rate of 18 million pounds a year. The plant consists of 59 acres of land, 192 burner buildings, 13 miscellaneous structures, and 20 dwellings, and has been using about 30 million cubic feet of natural gas a day. Employment is expected to reach 35 to 50 persons. The sale is subject to compliance with the Surplus Property Act and applicable regulations.

Jacobs Rubber Products, Inc., Danielson, Conn., a subsidiary of E. H. Jacobs Mfg. Co. of the same city, has announced a list of textile products developed and tested during the war when the factory devoted its entire output to the government's military requirements. Using Buna N and S, neoprene, and other synthetic rubber compounds, the following products are currently being produced: pickers, picker stick and spindle rod bumpers, spinning cots, and temple roll tubing.

Ross & Roberts, Inc., 1131 Campbell Ave., West Haven 16, Conn., recently formed to manufacture plastics products, is now producing its first item: unsupported vinyl film and sheeting of all grades. Instrumental in organizing the firm were Arthur M. Ross, Jr., its president, who formerly was with the research laboratory of General Electric Co., Schenectady, N. Y., and Alvin V. Roberts, formerly with the same company's works laboratory at Bridgeport, Conn.

Ralph B. Woodbury, formerly manager of purchasing with Hood Rubber Co., Watertown, Mass., has become associated with the crude rubber firm of James B. Cunningham Co., 248 Boylston St., Boston, Mass.

Hood Rubber Co., Watertown, Mass., has appointed Warren E. Glancy manager of development, succeeding Alfred A. Glidden, who has retired after nearly a half century with Hood. Mr. Glancy is a graduate in the department of chemical engineering of the Massachusetts Institute of Technology, Class of 1913. After serving a year with Prof. W. T. Hall, he joined the Hood chemical laboratory and except for the year 1918, when he was with the Chemical Warfare Service, he has been continuously with the rubber company, serving successively as tire chemist, chief chemist, and manager of laboratories. Mr. Glancy has also been on the executive committee of the division of Rubber Chemistry, American Chemical Society, and is a past chairman of the Boston Rubber Group. He is a member of the A.C.S., A.S.T.M., S.P.I. and A.A.A.S. and was for six years on the Waltham (Mass.) School Committee.

CANADA

1947 Rubber Prospects

A better supply of crude rubber in 1947 at a reduced price is seen in prospect for Canadian companies as a result of the recent announcement that international controls over allocation of crude rubber will be lifted January 2, 1947. The Combined Rubber Committee which allocated Allied supplies during the war will be disbanded December 31, 1946. This action also means that Canada will now have to decide whether to continue its rubber control and bulk purchasing of crude rubber or whether to hand this problem back to the individual companies. At present the Dominion owned Polymer Corp. buys all rubber and resells it to the rubber companies at 24.98¢ a pound in Canada for standard top grades.

There has as yet been no indication of what the Canadian Government's decision may be, but scheduled meetings of the Canadian Rubber Advisory Committee during November are almost certain to discuss the matter. Working for the abandonment of the present system will be the government's desire to drop all controls as quickly as possible for political reasons, and the difficulty, if not impossibility, of maintaining current marketing methods in 1947. On the other hand Canadian Government control has worked closely with the United States control, and the decision may therefore depend on what the U. S. does. At the same time U. S. action will depend on Congressional proposals to establish a 1:2 ratio for synthetic for reasons of national security and to stabilize rubber prices.

The decision to abandon international allocations will mean that Malayan rubber supplies should go to the highest bidder after December 31, 1946. There is considerable difference of opinion as to the price crude rubber will command in a free market. The recent U. S. purchase of 200,000 tons of Malayan rubber at 20¼¢ a pound, 3¼¢ under the price of 23½¢ f.o.b. the Far East set for the first half of this year, is regarded in Canadian circles as highly significant. Shipping charges are about 2¢ per pound so that if the price of crude fell to this level, it would mean a price of about 22¼¢ in Canada, which compares to the present Polymer selling price of 24.98¢.

The price of crude in relation to that of synthetic will undoubtedly be one of the primary factors determining the use of each. While the exact cost of producing synthetic rubber is subject to the normal variations of any manufacturing industry, representative costs of the two types being made by Polymer, based on experience, have been established at 16.96¢ a pound for GR-S and 18.72¢ a pound for GR-I. The present selling price in Canada for both GR-S and GR-I is 30.35¢ a pound, as compared with the 24.98¢ a pound now being charged for crude rubber.

Future of Synthetic Rubber

L. D. Dougan, assistant manager of Polymer Corp., Ltd., Sarnia, Ont., discussed the future of synthetic rubber at a meeting of the Western Ontario Medical Association. In explaining the in-

creasing demand for Polymer-made rubber despite competition from natural rubber, Mr. Dougan gave four reasons: first, the new peak reached by world demand for rubber articles; second, the stabilizing effect of synthetic rubber on world market prices for natural rubber that has led to the development of a wider variety of articles; third, the preference for Canadian-made synthetic rubber shown by foreign buyers; and fourth, the fact that the types of synthetic rubber produced by Polymer have stood the test of actual use and are now regarded as valuable materials superior to natural rubber in some respects.

Reviewing the rubber articles of direct interest to the medical profession, Mr. Dougan stated a comparatively small list is still being made of natural rubber, including surgeon's gloves, self-sealing bottle caps, nipples, atomizer bulbs, catheters, and a few other items, for which no synthetic has yet been discovered that will do so good a job as natural rubber. But the list of medical supplies being made from synthetic rubber is a much longer one and includes sponge rubber articles, such as bed pads, hot water bottles, ice bags, sheeting, aprons, and many other. Of the rubber items used by physicians, declared Mr. Dougan, few are more important than the tires and tubes for their cars. Answering the questions of how good these tires and tubes are, and whether they will withstand the high speed and rough use of ambulance and medical service, the speaker cited the recent Pike's Peak race in which the winning car, using synthetic tires, set a new record for the 12½-mile course which includes hairpin turns and rock-walled sides. He also cited results obtained in the United States government tests conducted at the proving grounds near San Antonio, Texas, in which test tubes were mounted in tires worn smooth from previous tests, nails driven into the tires, and the car started away in an attempt to reach 60 m.p.h. and maintain that speed until the air pressure in any one tire had dropped to 10 pounds. In these tests Butyl tubes that had previously been driven for 35,000 miles proved greatly superior to natural rubber tubes previously driven for only 25,000 miles. These used Butyl tubes behaved fully as well as new Butyl tubes, with no reduction in puncture or blowout resistance being noted. In the tests of the previously used natural rubber tubes it was impossible in most cases to attain the 60 m.p.h. speed because of failures, usually by tears at the punctured area. It would therefore seem, said Mr. Dougan, that the synthetic rubbers produced at Sarnia possess qualities so excellent as to justify their continued use in the rubber articles of today and of the future; however research still goes on for new and still better products.

OBITUARY

Edward O. Hutchens

PNEUMONIA caused the death, on September 21, of Edward O. Hutchens, president of Utility Mfg. Co., Cudahy, Wis., which he had founded in 1915. Funeral services and burial took place September 24 at Wisconsin Memorial Park, Milwaukee.

Mr. Hutchens, who was born in Monrovia, Ind., February 22, 1870, attended grade schools in Indianapolis until he was 12 when he was apprenticed to Geo. Merritt's Woolen Mills, where he remained four years. He then became assistant engineer at Dennison Hotes, Indianapolis, but in 1888 was made assistant chief engineer of the Indianapolis Light & Power Co., a position he held two years. The deceased next studied mechanical refrigeration and in 1894 designed and built two artificial ice plants for the Indianapolis Brewing Co. and then served as chief engineer for the company until 1898. That year Mr. Hutchens entered the employ of the Westinghouse Church Kerr Co. in New York, a connection that lasted until July 1, 1913.

During 1909-1910 he supervised rebuilding the G & J Tire & Rubber Co. at Indianapolis. Then from 1911 to 1913 he was assigned the task of rebuilding and equipping the Federal Rubber Co. plant at Cudahy, Wis., and when he left the New York concern, it was to become supervising engineer of the latter rubber company. He severed this connection in 1917, but in the meantime (1915) had organized the Utility company and also (in 1917) had opened an office as consulting engineer in Milwaukee, but moved to Eau Claire in April, 1918. In 1936, Mr. Hutchens was licensed as a professional engineer in the State of Wisconsin.

He belonged to Kenwood Lodge No. 303 F&AM, Lake Park Chapter No. 202 OES, Ivanhoe Commandery No. 24, Ancient Accepted Scottish Rite NMF (Wisconsin Scottish Rite Bodies), Milwaukee Engineering Society, and American Society of Mechanical Engineers.

Surviving are two sons, a daughter, a brother, a sister, five grandchildren, and two great grandchildren.

F. A. Swettenham

NEWS has been received from abroad of the death of Sir Frank A. Swettenham, one-time governor of the Straits Settlements and High Commissioner for the Malaya States, at his home in London, England, on June 11, at the age of 90.

Sir Frank, who was born in 1850, from the time he entered the Straits Settlements Civil Service in 1870 until 1904 when he retired, spent his career entirely in the Malayan Civil Services. He became Assistant Colonial Secretary for Native Affairs in 1876; British Resident, Selangor, in 1882; and British Resident of Perak in 1889. Appointed first Resident-General of F.M.S., in 1896, he was also made a Knight Commander of the Order of St. Michael and St. George. In 1901 he became Governor of the Straits Settlements and High Commissioner of Malaya, retiring in 1904.

Under his administration the country progressed rapidly; he built railways and roads through waste land and jungles and began the development of the rubber industry. A pioneer in the rubber industry, he never lost interest in its affairs; he was elected a member of the Council of the Rubber Growers' Association in 1910, served as chairman of the Association in 1922, and was chairman of several plantation companies.

Sir Frank wrote a number of books on the subject of which he was a recognized authority. His best known work, "British Malaya," first published in 1906, is considered a classic. His last book, "Footprints in Malaya," published in 1942, is an autobiography.

George B. Swarthout

AFTER an illness of several weeks, George B. Swarthout, New York district manager of The Goodyear Tire & Rubber Co., died in New York, N. Y., October 15. Funeral services were held in Denver, Colo., on October 21.

Mr. Swarthout was born in Denver on April 2, 1892, and was educated in Denver public schools and Denver Normal Preparatory School. He began his 27 years' with Goodyear on October 13, 1919, being first employed as a general line salesman in the Denver territory. He was named truck and bus tire representative for Seattle in 1926; in 1931 was appointed branch manager for Spokane; became assistant branch manager for Denver in 1933, and in 1936 was promoted to manager of the San Francisco district. His promotion to district manager of the New York district was announced in September, 1945.

Mr. Swarthout is survived by his widow.

Charles A. McGill

CHARLES A. McGILL, 51, manager of the central division of the replacement tire sales division of The B. F. Goodrich Co., Akron, O., with headquarters in Kansas City, died suddenly on September 12 while on a fiishing trip in Canada. Funeral services and burial were in Kansas City.

Mr. McGill had been with the company since May 1, 1922, after having attended the University of Utah. He held various sales posts in the Midwest before being appointed manager of the company's Kansas City district in 1934 and held that post for 10 years until he was placed in charge of the central division, comprising territory in the Midwest, including the Chicago, St. Louis, Kansas City, Minneapolis, Omaha, and other districts in that area.

Ernest R. Preston

ERNEST R. PRESTON, manager of the commercial sales division of the Goodyear Tire & Rubber Co., Akron, O., and former managing director of the company's operations in Great Britain, died at his home in Fairlawn Heights on September 27 after an illness of 18 months. Funeral services were conducted September 30.

Mr. Preston joined the Goodyear sales department in July, 1911, and earned many promotions. During World War I he was in charge of aeronautical sales at Wingfoot Lake, after which he was transferred to the British operations. Then in 1925 he was returned to Akron, in charge of truck and bus tire sales. The deceased was named to his last position in 1936.

Mr. Preston was born on May 23, 1891, at Natick, Mass.

Surviving are his wife, a daughter, a son, and a brother.

Patents and Trade Marks

APPLICATION

United States

2,405,579. **Venetian Blind Tape Completely Surrounded by a Coating of a Plastic Material Which Is Flexible at Atmospheric Temperature and Has a Smooth Moistureproof Surface.** J. L. Hunter, Riverside, Calif.

2,405,598. **In a Clipper Including Frame Means in Which a Cylindrical Shear Block Is Rotatively Disposed, an Inflated Pneumatic Tube to Provide a Resilient Support for the Shear Block.** W. J. Miller, assignor to Elliott Bay Mill Co., both of Seattle, Wash.

2,405,711. **Corset with Elastic Portions.** I. Rosner, assignor to Even-Pul Foundations, Inc., both of New York, N. Y.

2,405,810. **In a Dock Roller, Including an Elongated Member, Linearly Alined Rubber Rollers Journaled for Rotation on the Elongated Member to Support the Traverse of a Boat thereover.** B. L. Berg, Madison, Wis., and C. E. Watson, La Grange, Ill., Watson assignor to Berg.

2,405,822. **In a Coupling for Thin Walled Tube, a Ring of Resilient, Incompressible Material.** G. E. Franck, Riverside, assignor to Imperial Brass Mfg. Co., Chicago, both in Ill.

2,405,847. **In a Liquid-Cooled Internal Combustion Engine, Including a Cylinder Having a Jacketed Head Formed with Ports for the Passage of Cooling Liquid into the Jacket, a Metal Ring, with Complementary Ports, Rubber-Bonded to the Surface of the Head.** C. G. Pullin, assignor to Cierva Autogiro Co., Ltd., both of London, England.

2,405,851. **In a Trachea Connector Including a Trachea Cup Having a Deep Internal Chamber, a Cushioning Annulus of Cellular Rubber-Like Material Anchored to the Deepest End of the Cup.** O. Roberts, East St. Louis, Ill.

2,405,858. **An Acoustic Coupler for a Condenser Microphone Including Two Connected Tubular Parts and a Thin Rubber Diaphragm Clamped therebetween.** H. C. Silent, Los Angeles, Calif. assignor to the Government of the United States of America, as represented by the Secretary of the Navy.

2,405,910. **Windshield Wiper.** T. J. Smulski, Gary, Ind., assignor to Productive Inventions, Inc., a corporation of Ind.

2,405,986. **Self-Sealing Fuel Container, with Walls Built up of an Outer Layer of Raw Rubber, a Layer of Mechanically Expanding Plasticized Neoprene, a Layer of Solvent Resistant Neoprene, and a Thin Impermeable Film of Polyamide.** D. J. Sullivan, Fairfield, Conn., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,406,039. **Ethylene Polymer Coated Metal Article.** M. J. Roedel, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,406,090. **Protective Ankle Shield of Light Material Including an Elastic Gusset and an Elastic Shank Strap.** G. N. Mas, Washington, D. C.

2,406,108. **Rinse Wringer Including an Endless Conveyer Belt of Non-Rigid Material and Intake and Discharge Rolls.** A. Schellenberg Joliet Ill.

2,406,271. **In an Electric Lamp Including a Bulb Having a Sealed Neck, Resilient Shock-Absorbing Material about and Firmly Secured to the End of the Neck.** I. H. Van Horn, East Cleveland, O., assignor to General Electric Co., a corporation of N. Y.

2,406,317. **Double Suction Plunger.** G. Bonde, Marinette, Wis.

2,406,330. **Fountain Pen Filling Unit.** W. J. Heagney, assignor to Parker Pen Co., both of Janesville, Wis.

2,406,367. **Means for Preventing or Removing Ice or Frost from Aircraft Propellers.** T. R. Griffith and J. L. Orr, assignors to Honorary Advisory Council for Scientific and Industrial Research, all of Ottawa, Ont., Canada.

2,406,390. **Wheel Cover of Form Sustaining, but Resiliency Yieldable Plastic Material.** G. A. Lyon, Allenhurst, N. J.

2,406,485. **Hose Pump.** H. A. Aenold, assignor to University of Tennessee Research Corp., both of Knoxville, Tenn.

2,406,487. **Eraser Having a Source of Suction and a Suction-Operated Movable Means.** C. A. Brewer Noroton Heights, Conn.

2,406,569. **Rubber Heel.** M. L. Silverstein, Dorchester, Mass.

2,406,600. **Medical Appliance Including a Tube of Resilient Material Closed at One End by a Relatively Thin Diaphragm.** J. A. Forestiere. Brooklyn, N. Y.

2,406,628. **In Apparatus for Forming Skis Etc., a Section of Expansible Compressed Air Hose.** E. R. Patchen, assignor to Local Industries, Inc., both of Lakeville, Conn.

2,406,629. **Sealing Element for Refrigerating Apparatus.** C. F. Petkwitz, assignor to General Motors Corp., both of Dayton, O.

2,406,653. **In a Friction Assembly, a Bonding Element Composed of Cellulose Fibers Permeated with a Cured Resin.** C. S. Batchelor, Nichols, Conn., assignor to Raybestos-Manhattan, Inc., Passaic, N. J.

2,406,679. **Self-Sealing Fuel Tank Including a Metal Frame within Which Is a Free-Lying Flexible Cell Built up of an Inner Layer of Fabric Impregnated with Artificial Rubber, a Layer of Artificial Rubber, a Layer of Crude Rubber, and a Layer of Soft Vulcanized Rubber.** R. B. Gray Dundalk, and J. C. De Weese, Parkville, assignors to Glenn L. Martin Co., Baltimore, all in Md.

2,406,708. **For a Flexible Rubber-Like Tank Cell with a Relatively Large Circular Opening in Its Wall, an Access Door of the Same Material as the Tank Cell.** F. J. Pepersack, Towson, assignor to Glenn L. Martin Co., Middle River, both in Md.

2,406,718. **Embossing Bowl Made up of a Large Number of Centrally Perforated Paper Disks Impregnated at Least on Their Periphery with a Water Soluble Polyvinyl Alcohol Composition.** R. E. Thomas, Newburgh, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington Del.

2,406,767. **High-Frequency Sound Device Including a Rubber Compound Casing Member Having Two Concentric Cylindrical Portions; the Edge of the Inner Cylindrical Portion Has a Metal Disk Bearing a Flexible Rubber Ring in a Rabbet in the Edge of the Disk.** H. C. Hayes, Washington, D. C.

2,406,843. **In a Method of Making Molded Plywood Articles with Curved Surfaces, the Use of a Sheet of Vulcanized Rubber as an Aid in Applying Pressure.** H. J. Luth, H. B. Scheidemantel, and S. R. Krupnick, Muskegon, Mich., assignors to Brunswick-Balke-Collender Co., Chicago, Ill.

2,406,875. **In a Flexible Coupling Including a Driven Shaft with Radially Disposed Arms Cooperating with the Flat Faces of a Coupler in Torque-Transmitting Pairs, a Body of Resilient Rubber Connected to the Opposed Faces of the Pairs.** L. Wallerstein, assignor to Lord Mfg. Co., both of Erie, Pa.

2,406,888. **Breathing Apparatus.** P. E. Meidenbauer, Jr., assignor to Scott Aviation Corp., both of Lancaster, Pa.

2,406,903. **Material for Fuel Container Consisting of a Self-Healing Intermediate Layer of Milled Uncured Rubber Bonded to an Outer Layer of Tough Elastic Material and an Inner Layer of Solvent Resistant Flexible Elastic Material.** S. Rethorst, Los Angeles, Calif., assignor, by mesne assignments to Consolidated Vultee Aircraft Corp., a corporation of Del.

2,407,076. **Fluid-Tight Radio Shielded Joint.** J. R. Harkness, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,407,189. **Conductive Shoe Having a Sole of Relatively Soft Flexible Material with High Resistance to Static Electrical Charges.** J. E. Taber, Jr. South Bend, and K. L. Keene, assignors to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, both in Ind.

2,407,215. **Windshield Wiper System.** J. W. Anderson, Gary, Ind., assignor to Productive Inventions, Inc., a corporation of Ind.

2,407,218. **Fluid Seal Including a Flexible Rubber Sleeve.** K. A. Beier, assignor to Schwitzer-Cummins Co., both of Indianapolis, Ind.

2,407,236. **Rubber Spring Mounting for a Vehicle.** J. W. Heiney, Allentown, Pa., assignor to Mack Mfg. Corp., New York, N. Y.

2,407,314. **In a Threaded Self-Locking Fastening Device, a Locking Element of Non-Metallic Elastic Material.** V. V. Mason, Scotch Plains, assignor to Elastic Stop Nut Corp. of America, Union, both in N. J.

2,407,455. **Liquid Container of Flexible Non-Metallic Material.** L. Shakesby, Wolverhampton, and S. H. Smith, Manchester both in England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,407,493. **In Electrical Apparatus Including in Combination a Tank Containing an Electrical Conductor and a Halogenated Aromatic Hydrocarbon Insulating Fluid, a Gasket Material between Adjoining Portions of the Tank, the Gasket Material Consists of a Plasticized Copolymer of Butadiene and Acrylonitrile; the Plasticizer Is Dissolvable in the Fluid at Operating Temperatures whereby the Fluid Is enabled to Maintain the Plasticity of the Gasket Material.** L. P. Hart, Jr., Pittsfield, Mass., assignor to General Electric Co., a corporation of N. Y.

2,407,514. **In Apparatus for Molding Fiber-Cement Sheets, a Resilient Rubber Texture Plate Reciprocally Mounted in the Mold Cavity and Forming Its Base.** E. W. Rembert Hinsdale, Ill., assignor to Johns-Manville Corp., New York. N. Y.

2,407,515. **Tank and a Layer of Close Cell Gas Expanded Rubber over it.** D. Roberts, deceased, late of New York, N. Y., by D. Roberts, Jr., executor, assignor to Rubatex Products, Inc., both of New York, N. Y.

2,407,520. **Dielectric Panel of Asbestos Fibers Coated and Bonded together with Heat-Hardened Phenol-Aldehyde Resin.** G. Smolak, Somerville, N. J., assignor to Johns-Manville Corp., New York, N. Y.

2,407,528. **Apparatus for Treating Material on the Leading Edge of a Propeller Blade; the Apparatus Includes an Inflatable Flexible U-Shaped Element.** J. O. Antonson, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,407,588. **Rubber Elements in a Shock Absorber.** L. F. Thiry, Montelair, N. J., assignor to General Tire & Rubber Co., Akron O.

Dominion of Canada

436,312. **Finger for Feeding Stock in an Automatic Screw Machine Including a Sleeve of Oil Resistant Rubber or Similar Material Adapted to Receive a Bar of Stock.** F. L. Green, Rockton, Ill., U.S.A.

436,360. **In a Press Including Multiple Molds and Dies and Having Separate Recesses in the Press Head for Receiving the Projecting Stems of the Respective Dies, Resilient, Incompressible Material Arranged in Each of the Recesses.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of E. H. Fisher, Derry, Pa., U.S.A.

436,379. **In a Device for Fabricating an Assembly of Molded Wood or the Like, a Rigid Die Member and a Blanket of Flexible Rubbery Material.** Duramold Aircraft Corp., New York, N. Y., assignee of R. L. Beasecker, Grand Rapids, Mich., U.S.A.

436,384. **In a Method of Making Fuel Containers, Leak Proofing Rows of Stitching by Coating Them with Synthetic Rubber and Applying Reinforcing Strips.** Imperial Chemical Industries, Ltd., London, assignee of L. Shakesby, Bradmore, Wolverhampton, Both in England.

436,421. **In an Open Loop Clamp for Attaching a Bundle of Wires to a Support, Means for Cushioning the Clamp, Including a Strip of Rubber-Like Material.** Tinnerman Products, Inc., assignee of G. A. Tinnerman both of Cleveland, O., U.S.A.

436,447. **Molding Apparatus.** T. H. and W. B. Kirk, both of Lakeworth, Fla., U.S.A.

436,460. **Foundation Garment Including a Horizontally Elastic Portion.** H. J. Dubner, Forest Hills, L. I., N. Y., U.S.A.

436,488. **Continuous Cord Including a Flexible Core, a Flexible Tubular Conductor, and a Flexible Sleeve Having at Least One Tubular Layer of Extruded Insulation Material.** Belden Mfg. Co., Chicago, assignee of H. H. Wermine, Wheaton, both in Ill., U. S. A.

436,498. **Spinning Bucket Including an Acid Resistant Resinous Binder in Combination with a Fabric Filler.** Canadian General Electric Co., Ltd., Toronto, Ont., assignee of H. M. Richardson, Pittsfield, Mass., U.S.A.

436,555. **In a Belt Conveyer Idler, Idler Rolls Including a Metal Hub Surrounded by a Sleeve of Resilient Material.** A. Searles, Moscow, Pa., and C. A. Schwartz, Yonkers, N. Y., both in the U.S.A.

436,562. **Box Including Prefabricated Waterproof Box Panels, Each Consisting of a Wooden Panel, and a Waterproof Plastic Lining.** H. A. DePhillips, Belleville, N. J., U.S.A.

436,594. **Rubber Frame for Goggles.** American Optical Co., Southbridge, assignee of Polaroid Corp., assignee of C. A. Baratelli, both of Cambridge, and W. Lown, Boston, all in Mass., U.S.A.

436,643. **In a Radial Mercury Actuated Centrifugal Clutch, a Driving Member Including a U-Shaped Rubber Gland.** Mercury Clutch Corp. assignee of H. J. Zimmermann, both of Canton, O., U.S.A.

436,655. **Lamination Including a Sheet of Polyvinyl Alcohol, a Cellulose Ester Base, and, as Bonding Agent, a Partially Hydrolyzed Polyvinyl Ester.** Polaroid Corp., assignee of W. H. Ryan, both of Cambridge, Mass., U.S.A.

436,664. **Valve Assembly Molded from Synthetic Plastic Material.** Thompson Products Inc., Cleveland, assignee of R. R. Curtis, Dayton, both in O. U.S.A.

436,672. **Laminated Sheet Composed of Rubber Hydrochloride Film United by an Intermediate Layer of a Benzene-Soluble Copolymer Having High Resistance to the Transfer of Moisture Vapor and Formed from Vinyl Chloride and Vinylidene Chloride.** Wingfoot Corp., assignee of F. H. Manchester, both of Akron, O., U.S.A.

436,677. **In a Torque Transmitting Apparatus, a Member of Rubber-Like Yieldable Material.** Polaroid Corp., Cambridge, assignee of one-fourth of the interest of O. E. Wolff, Chestnut Hill, both in Mass., U.S.A.

436,684. **Floor for a Stable and Like House, Composed of Slabs of Rubber Grooved on Their Upper Surfaces.** C. W. Bastiaansen, Roosendaal, Holland.

436,707. **Pneumatic Tire.** G. A. Lyon, Allenhurst, N. J., U.S.A.

436,733. **Coated Abrasive Including a Solvent**

Resistant Coating and a Coating of Rubber in a Form Readily Swelled, but not Readily Dissolved by Liquid Hydrocarbon Solvents. Behr-Manning Corp., assignee of N. E. Oglesby, both of Troy, N. Y., U.S.A.

436,773. **Molded, Resilient, Rubber Composition Bearing Adapted for Cooperation with an External Metal Retaining Member to Hold the Rubber Bearing in Interlocked Position therein.** Lea Fabrics, Inc., Newark, assignee of M. R. Buffington, Milburn, and E. G. Jegge, Montclair, all in N. J., U.S.A.

United Kingdom

579,127. **Wheels or Tires of Wheels of Power-Driven Vehicles.** C. R. McCallum.

579,128. **High-Frequency Transmission Lines or Cables and Connections therefor.** E. C. Cork.

579,131. **Nose Protectors, Face Masks, Etc.** A. O. Bindschedler.

579,188. **Molded Wheels of Rubber or Other Plastic Material.** H. M. C. Wheels, Ltd., and H. P. Creasy.

579,226. **Flexible Couplings.** Dunlop Rubber Co., Ltd.

579,323. **Inflatable Dinghies.** R. F. D. Co., Ltd., and P. W. L. Williams.

579,344. **Laminated Sheet Material.** A. Kremer.

579,393. **Aircraft Windscreen Wipers.** W. M. and A. L. Melmore.

579,423. **Pneumatic Tires.** Catopa, Ltd., and E. Chippendale.

579,701. **Laminated Structure.** Imperial Chemical Industries, Ltd.

579,768. **Liquid Fuel Containers and Adhesives therefor.** B. J. Balfe and Imperial Chemical Industries, Ltd.

579,799. **Annular Sealing Means for Pistons and the Like.** Bendix Aviation Corp.

PROCESS

United States

2,405,802. **Retreading Tires.** F. H. Taber, New Bedford, Mass.

2,405,943. **Applying Polyvinyl Compounds as Recaps to Worn Carcasses.** J. H. Doering, Detroit, and R. H. McCarroll, assignors to Ford Motor Co., both of Dearborn, both in Mich.

2,406,191. **Incorporating Polyisobutylene into Polystyrene to Form Elastic Compositions Suitable for Electrical Cable Insulation.** H. J. Cameron, Gary, Ind., assignor to E. F. Seifert, Chesterton, Ind.

2,406,542. **Lined Ebonite Container.** B. L. Davies, assignor to United Ebonite & Lorival, Ltd., both of Little Lever, England.

2,406,678. **Resin Impregnated and Coated Container.** J. D. Gerahty, New York, N. Y.

2,406,679. **Forming Composite Hollow Structures of Sections of Fibrous Material and Thermoplastic Resinous Material.** J. D. Lincoln, assignor to Virginia-Lincoln Corp., both of Marion, Va.

2,406,714. **Heat-Treating a Thermosetting Plastic.** H. A. Strickland, Jr., Detroit, Mich., assignor, by mesne assignments, to Budd Co., Philadelphia, Pa.

2,406,830. **Sealing together Two Pieces of Waterproof Fabric.** H. H. Hamam and C. E. Whalen, assignors to Warren Featherbone Co., all of Three Oaks, Mich.

2,407,152. **Building a Pneumatic Tire.** J. I. Haase, assignor to Wingfoot Corp., both of Akron, O.

2,407,549. **Coating a Tissue Paper with Thermoresponsive Resins.** I. Gurwick, New York, N. Y.

2,407,559. **Resilient Bushings.** A. S. Krotz, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

Dominion of Canada

437,417-418. **Casing for a Stuffed Product.** Sylvania Industrial Corp., assignee of F. H. Reichel and A. E. Craver, all of Fredericksburg, Va., U.S.A.

436,750. **Producing Designs in Flexible Plastic Sheet Material.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of V. H. Hurt, Edgewood, R. I., U. S. A.

United Kingdom

579,083. **Articles of Rubber-Like Materials.** International Latex Processes, Ltd.

579,119. **Molded Articles of Expanded Rubber and Like Thermohardening Materials.** Expanded Rubber Co., Ltd. and A. Cooper.

579,137. **Non-Metallic Collapsible Tubes.** Viscose Development Co., Ltd.

579,240. **Vulcanized Rubber Articles.** Callender's Cable & Construction Co., Ltd., and H. E. Kretschmer.

579,419. **Tapered Polyamide Filaments.** L. Leben and Imperial Chemical Industries, Ltd.

579,447. **Composite Articles.** United States Rubber Co.

579,551. **Sheets, Tubes, and Other Articles from Polystyrene.** B. X. Plastics, Ltd., and D. C. Nicholas.

579,556. **Applying Protective Covering for Metals.** Hercules Powder Co.

579,662. **Insulated Wires and Cables.** Callender's Cable & Construction Co., Ltd., and E. Tunnicliff.

579,663. **Insulated Cables and Wires.** N. Dixon, R. S. Robinson, and W. T. Glover & Co., Ltd.

579,752. **Molding Reinforced Plastics.** S. D. Pollitt.

CHEMICAL

United States

2,405,558. **Hard Stable Resin from a Beta-Piene Terpene Fraction Reacted with a Fluoride of Boron as a Polymerization Catalyst.** J. N. Borglin, assignor to Hercules Powder Co., both of Wilmington, Del.

2,405,602. **Adhering Fibrous Materials together by Means of a Synthetic Rubber-Like Adhesive Containing a Filler, a Solvent Activator for the Adhesive, and a Color Producing Agent Capable of Reaction with the Filler.** F. V. Nugent, Abington, assignor to B. B. Chemical Co., Boston, both in Mass.

2,405,724. **Concentrating a Polychloroprene-in-Aqueous Medium Dispersion, wherein the Polychloroprene Particles Are Negatively Charged, with the Aid of a Prescribed Amount of a Water-Soluble Alginate.** F. N. Wilder, Woodstown, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,405,784. **Derivatives of Chlormethyl Ethers of Polyoxyethylene Glycols.** D. Geltner, Astoria, N. Y., assignor to Onyx Oil & Chemical Co., a corporation of Del.

2,405,806. **Resinous Ethers of Hydroxyaryl Compounds.** O. Albrecht, Neue-Welt, C. Graenacher, Riehen, R. Sallmann, Bottmingen, and C. Rossi, assignors to Society of Chemical Industry in Basle, both in Basel, all in Switzerland.

2,405,817. **Composition Including a Hard Product of Polymerization of a Mixture of an Isolated, Fusible Partial Polymer ond Divinyl Benzene and Styrene.** G. F. D'Alelio, Pittsfield, Mass. assignor to General Electric Co., a corporation of N. Y.

2,405,863. **Acid Soluble Condensation Product from Dicyanodiamide, Urea, Ammonium Chloride and Formaldehyde.** J. Treboux, Riehen, assignor to J. R. Geigy, A.G., Basel, both in Switzerland.

2,405,886. **Brightly Colored Compound of the Formula:** $OH \cdot C_{10}H_6 \cdot CH:N \cdot R \cdot N:CH \cdot C_{10}H_6OH$. A. F. Hardman, assignor to Wingfoot Corp., both of Akron, O.

2,405,926. **Adhesive Composition Including a Predominant Portion of a Condensation Product of Castor Oil with a Maleic Half Ester of a Monohydric Alcohol and a Minor Portion of a Compatible Cohesive Agent.** R. J. Piepke North Brunswick Township, J. H. Emigh, Milltown, and C. Olsen Pike, Highland Park, all in N. J., assignors to Industrial Tape Corp. a corporation of N. J.

2,405,933. **Composition Including a Normally Solid Polymer of Ethylene and a Mixture of Naturally Occurring Fatty Acid Glyceride and an Ester of a Carboxylic Acid Containing at Least 14 Carbon Atoms with an Alcohol Containing at Least 8 Carbon Atoms.** W. L. Alderson, Jr., assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,405,950. **Polymerization of a Monoolefin at Elevated Temperature and Pressure in the Presence of a Catalyst from the Group of Hydrazines and Hydrazinium Compounds.** W. E. Hanford, Easton, Pa., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,405,962. **Continuously Passing Ethylene in a Tubular Pressure-Resistant Vessel at a Pressure of 500 to 1500 Atmospheres, a Temperature of 150 to 250° C., in the Absence of a Dispersing Medium and in the Presence of Water and a Material from the Group of Benzene and Chlorobenzene, to Produce High Tensile Solid Polymers of Ethylene.** A. T. Larson, Wilmington, Del., and N. W. Krase, Swarthmore, Pa., assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,405,965. **Aqueous Emulsion of Synthetic Linear Polycarbonamide Which Will Yield Thin Continuous Films.** R. M. Leekley, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,405,966. **Preparation of Nitrilo-Triacetonitrile, Which Includes Reacting Aminoacetonitrile with Formaldehyde and Hydrogen Cyanide in the Presence of an Aqueous Mineral Acid Catalyst.** D. J. Loder, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,405,967. **Diester of Diglycolic Acid.** D. J. Loder, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,405,971. **Halogenated Polyethylene Obtained by Reacting Ethylene Polymer in Solution in Carbon Tetrachloride with Sulfuryl Chloride in the Presence of Benzoyl Peroxide and at a Temperature between 50 and 150° C.** A. McAlevy, Kennett Square, Pa., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,405,977. **Transparent Films from a Normally Solid Polymer of Ethylene.** F. T. Peters, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,405,988. **Organo-Silicon Esters.** A. J. Barry, assignor to Dow Chemical Co., both of Midland, Mich.

2,406,153. **Depolymerization of Polymeric Tetrafluoroethylene by Heating at a Temperature above Its Decomposition Point under Reduced Pressure Not Exceeding 150 Mm. of Mercury.** E. E. Lewis, Lyndhurst, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,406,217-218. **Producing a Stable Aqueous Solution of Urea-Formaldehyde Condensation Product by Heat-Reacting Aqueous Formaldehyde with a Mixture of Urea and a Mono-Tertiary-Alkyl Urea.** M. T. Harvey, South Orange, N. J., and S. Caplan, New York, N. Y., assignors to Harvel Research Corp., a corporation of N. J.

2,406,227. **For a Container Closure a Sealing Element Consisting of a Cured Alkyd Resin.** E. G. King, Pittsburgh, assignor to Armstrong Cork Co., Lancaster, both in Pa.

2,406,260. **Cold-Flow Resistant Rubber-Like Organic Polysulphide Polymers from an Alkaline Polysulphide Condensed with a Mixture of a Halohydrin in a Polyhalo-Aliphatic Compond Containing at Least One —CH$_2$ Radical, and Then Compounded with One of the Group of Alkenedioic Acids and Anydrides.** L. L. Ryden, assignor to Dow Chemical Co., both of Midland, Mich.

2,406,298. **For a Container Closure a Sealing Compound Including a Cured Alkyd Resin.** E. G. King, Pittsburgh, assignor to Armstrong Cork Co., Lancaster, both in Pa.

2,406,319. **For an Electrical Conductor, a Dielectric Composition Including a Polymer of a Dihalogenated Styrene; the Halogen Atoms Are Substituted on Adjacent Positions in the Styrene Ring.** L. A. Brooks, Stamford, Vt., and M. Nazzewski, assignors to Sprague Electric Co., both of North Adams, Mass.

2,406,339. **Improved Process for Producing Resinous Materials from Formaldehyde and a Material from the Group of Phenols and Cyclohexanol, Which Includes Condensing the Ingredients in the Presence of Hydrogen Fluoride whereby the Reaction Time Is Substantially Reduced.** D. E. Badertscher and H. G. Berger, both of Woodbury, and R. B. Bishop, Pitman, both in N. J., assignors to Socony-Vacuum Oil Co., Inc., a corporation of N. Y.

2,406,385. **Making an Abrasive Article from an Unvulcanized Butadiene Polymer Plasticized with a Halogen Bearing Agent, Abrasive Grain, a Vulcanizing Agent, and a Resin Polymer Having Amino Groups and Capable of Reacting with the Halogen-Bearing Plasticizer.** S. S. Kistler, West Boylston, assignor to Norton Co., Worcester, both in Mass.

2,406,558. **Utilizing Scrap Polymeric Methyl Methacrylate Resin Including Cellulosic Matter.** H. T. Neumann, New York(N. Y., assignor to one-third to L. G. Arpin, Montclair N. J. and one-third to E. L. Symonds, Jackson Heights, N. Y.

2,406,561. **In Preparing Higher Acrylic Esters by the Alcoholysis of Methyl Acrylate, the Steps Including Removing the Methanol Formed in the Alcoholysis Reaction by Distilling It as an Azeotrope with an Aliphatic Hydrocarbon with Boiling Point at Least 5° C. below That of Methyl Acrylate.** C. E. Rehberg, assignor to United States of America as represented by C. R. Wickard, Secretary of Agriculture, and his successors in office.

2,406,621. **Polysiloxane Resins from a Solution of a Mixture of Methyl Chlorosilanes in an Aromatic Hydrocarbon Solvent, Added to a Two-Phase Hydrolysis Medium Including an Aliphatic Alcohol, an Aromatic Hydrocarbon Solvent, and an Aqueous Solution of Hydrochloric Acid.** J. Marsden, Schenectady, N. Y.; assignor to General Electric Co., a corporation of N. Y.

2,406,657. **Plasticizers Obtained by Reducing the Condensation Product of Furfuryl Acetate and Maleic Anhydride with Hydrogen in Non-Reaction Solution in the Presence of a Palladium-Carbon Catalyst.** W. P. Bitler, Haverstraw, and L. Nicholl, Nyack, assignors to Kay-Fries Chemicals, Inc., West Haverstraw, all in N. Y.

2,406,674. **Contacting Acetylene and N-Butyl Alcohol in a Medium Composed at Least Mainly of an Amine from the Group of Secondary and Tertiary Aromatic Amines, at a Temperature**

Rubber Compounders... save money... get quality!

EXAMPLE

Perbunan + Low cost plasticizer Nuso 55 = High quality compounds that process readily ...with low costs!

Why spend extra money for expensive plasticizers? Check the formula above carefully. It offers you quality with economy using low cost plasticizer Nuso 55 with Perbunan. Consider them both for quality compounds with money saved!

PERBUNAN
REG. U. S. PAT. OFF.

THE SYNTHETIC RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME

PROOF

Perbunan with Nuso 55

Recipe	
Perbunan	100.0
Zinc Oxide	5.0
Stearic Acid	1.0
Medium Processing Channel Black	50.0
Nuso 55*	20.0
Benzothiazyl Disulfide	1.0
Sulfur	2.0

PHYSICAL PROPERTIES	PERBUNAN 18	PERBUNAN 26
UNCURED STOCK		
Mooney Viscosity (ML) 1 1 2 minutes at 212 F	39	41
Extruded Appearance	Very smooth	Smooth
VULCANIZED STOCK: CURED 60 MINUTES AT 287 DEGREES FAHRENHEIT		
Rebound at 40 degrees Centigrade, per cent	47.7	54.1
Compression Set under Constant Deflection of 30 per cent for 22 hours at 158 F, per cent	44.0	35.5
Low Temperature Brittleness Test Passed at degrees Fahrenheit	—40	—40
Hardness and Stress-Strain Properties		
Original		
Shore Hardness	50	54
Tensile Strength, psi	2930	3350
Elongation, per cent	745	725
Modulus at 300 per cent Elongation, per cent	545	690
Aged at 212 degrees Fahrenheit for 70 hours		
Shore Hardness	62	62
Tensile Strength, psi	2630	3095
Elongation, per cent	315	340
Modulus at 300 per cent Elongation, per cent	2515	2515
Aged in ASTM Test Oil No. 3, at 212F for 70 hours		
Shore Hardness	36	53
Tensile Strength, psi	1225	2355
Elongation, per cent	370	395
Modulus at 300 per cent Elongation, per cent	835	1525
Volume Increase, per cent, on Immersion in:		
40 per cent aromatic test fluid SR-6 at room temp. for 48 hours	84	53
Gasoline test fluid SR-10 at room temp. for 48 hours	27	11
ASTM Test Oil No. 3 at 212 F for 70 hours	33	14

*Nuso 55 properties are: Specific Gravity 0.9509; Flash Point 390 F and Aniline Point 130 F.

STANCO DISTRIBUTORS, INC., 26 Broadway, New York 4, N. Y.; First Central Tower, 106 South Main Street, Akron 8, Ohio; 221 North LaSalle St., Chicago 1, Illinois; 378 Stuart Street, Boston 17, Massachusetts. West Coast Representatives—H. M. Royal Inc., 4814 Loma Vista Avenue, Los Angeles 11, California. Warehouse stocks in Elizabeth, New Jersey; Los Angeles, California; Chicago, Illinois; Akron, Ohio; and Baton Rouge, Louisiana.

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of 150-200° C., to Produce Vinyl N-Butyl Ether. W. J. R. Evans, Manchester, England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,406,684. **Polymerization of Methyl Isopropenyl Ketone.** J. W. Heyd, Dayton, O., assignor to Monsanto Chemical Co., a corporation of Del.

2,406,717. **Copolymer of Vinyl Fluoride and a Vinyl Ester of a Lower Saturated Fatty Acid.** C. A. Thomas, Dayton, O., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,406,722. **Preserving Rubber by Incorporating a Small Proportion of a Secondary Aromatic Amine Antioxidant and a Member of the Group of Phthalocyanines Which Consist of Carbon, Hydrogen, and Metal Complexes of Such Phthallocyanines in Which the Metals Are from the Class of Copper, Silver, Tin, Cobalt, Nickel, Magnesium, Zinc and Aluminum.** J. R. Vincent, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,406,837. **Composition Including Polyvinyl Fluoride Stabilized against Discoloration and Decomposition by Means of Dicyclohexylamine.** F. L. Johnston, Claymont, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del.

2,407,038. **Adhesive Composition Including Polymerized 2-Chloro-Butadiene 1,3 and a Preformed Vulcanized Thermoplastic, Sticky Mix of Sulfur, a Rosin and a Long Chain Unsaturated Fatty Oil.** P. Stamberger, Dover, Del.

2,407,039. **Vinyl Chloride Produced by Passing Acetylene and Hydrogen Chloride into a Suspension of Active Carbon Impregnated with Mercuric Chloride in an Inert Diluent from the Group of Hydrocarbons and Chlorinated Hydrocarbons Which Are Liquid between 120 and 150° C., and Do Not Dissolve Mercuric Chloride.** H. M. Stanley, Tadworth, England, assignor to Distillers Co., Ltd., Edinburgh, Scotland.

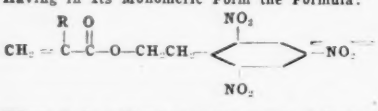
2,407,044-045. **Phenols.** D. Tyrer, Stockton-on-Tees, England.

2,407,051. **Resin Composition Containing a Stabilizing Amount of a Mononuclear Aryl Hydroxy Benzoate and a Resin Resulting from Polymerization of Methyl Isopropenyl Ketone.** D. E. Adelson, Berkeley, and H. Dannenberg, assignors to Shell Development Co., both of San Francisco, both in Calif.

2,407,061. **Filaments, Rods, Tubes, Sheets, Containers, etc., from a Monomeric Acetal of a Mono-Aldehyde Reacted with a Solid Polyvinyl Base Material.** J. Dahle, West Newton, assignor, by mesne assignments to Pro-phy-lactic Brush Co., Northampton, both in Mass.

2,407,107. **Stable Dispersion Consisting of the Product of the Emulsion Polymerization of Alkacrylate Monomer Dispersed in an Aqueous Solution of a Water Soluble Partially Saponified Polyvinyl Acetate, and in the Presence of a Refined Petroleum Hydrocarbon Boiling above 110°** C. J. E. Smith, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,407,131. **As a New Compound, a Substance Having in Its Monomeric Form the Formula:**



Where R Is a Member of the Group of Hydrogen and Methyl. H. A. Bruson and G. B. Butler, assignors to Rohm & Haans Co., all of Philadelphia, Pa.

2,407,138. **Producing a 2-Cyanoethyl 2-Thiazyl Sulfide by Condensing One Mol of a 2-Mercapto-Thiazole with One Mol of Acrylonitrile in the Presence of a Catalyst.** A. M. Clifford and J. G. Lichty, Stow, assignors to Wingfoot Corp., Akron, both in O.

2,407,143. **Stable Adhesive Including Phosphorus Oxychloride Treated Natural Rubber Dissolved in Monomeric Styrene and from 0.1 to 5% of Ethylamine as a Stabilizer.** T. Daur, Mannheim, and W. Daniel, Ludwigshafen-on-the-Rhine, both in Germany; vested in the Alien Property Cusodian.

2,407,149. **Composition Including 2 Chlor-Butene-2, Chloroform, and an Aliphatic Liquid Alcohol.** C. B. Gardenier, Belleville, assignor to Thomas A. Edison Inc., West Orange, both in N. J.

2,407,183. **A new Composition Including an Ester of Alkyl Phenyl Ethyl Alcohol in Which the Alkyl Substituent Appears on the Ring, and Natural or Synthetic Rubber.** F. J. Soday, Swarthmore, Pa., assignor to United Gas Improvement Co., a corporation of Pa.

2,407,193. **Non-Staining Reclaim Rubber from Alkali Reclaimed Rubber Refluxed with a Solvent Mixture Containing 50 to 90% of Carbon Tetrachloride; the Remainder of the Solvent Is Methyl Alcohol.** H. H. Thompson, assignor to Wingfoot Corp., both of Akron, O.

2,407,246. **Compounds Represented by the Formula $CF_2CXClCCl.2CF_2$, in Which X Is One of the Group Consisting of H and Cl.** A. F. Benning, Woodstown, N. J., and J. D. Park, assignors to Kinetic Chemicals, Inc., both of Wilmington, Del.

2,407,265. **Copper Compounds of Mercaptans Derived from Terpenes.** A. L. Fox, Woodstown, N. J., assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,407,266. **Copper Compound of a Mercaptan Derived from a Pinene.** A. L. Fox, Woodstown, N. J., assignor to E. I. du Pont de Nemours & Co., Inc. Wilmington, Del.

2,407,292. **Compounds from the Class of Organic Thiocyanates Represented by the Formula: Hal_2CRS_2N and $Hal_2C{=}CHRSSN$, where Hal is Halogen and R Is an Alkylene Radical.** P. L. Salzberg, Carrcroft, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del.

2,407,373. **Dehydrogenating Butene to Form Butadiene.** K. K. Kearby, Elizabeth ,N. J., assignor to Standard Oil Development Co., a corporation of Del.

2,407,376. **Colloidal Aqueous Solution of a Dimethylol Urea Resin.** C. S. Maxwell Old Greenwich, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,407,396. **Tetrafluoroethylene Stabilized with Sufficient Hydrocarbon Thiol to Prevent Polymerization at 25° C. and Superatmospheric Pressure.** M. M. Brubaker, Boothwyn, Pa., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,407,405. **Tetrafluoroethylene Stabilized with Sufficient Ethylenically Unsaturated Hydrocarbon to Prevent Polymerization.** M. A. Dietrich, Claymont, and R. M. Joyce, Jr. Marshallton, assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington, all in Del.

2,407,413. **Clear, Plasticized Bodies of Styrene-Maleic Anhydride Resin Obtained from Styrene and Maleic Acid Polymerized in the Presence of Dissolved Methyl Levulinate.** H. L. Gerhart, Milwaukee, Wis., assignor to Pittsburgh Plate Glass Co., Allegheny County, Pa.

2,407,419. **Tetrafloroethylene Stabilized with Sufficient Tertiary Hydrocarbon Amine to Prevent Polymerization at 25° C. and Superatmospheric Pressure.** W. E. Hanford, Easton, Pa. assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,407,472. **Unsaturated Nitriles.** D. J. Butterbaugh, Philadelphia, and Le R. U. Spence, Elkins Park, assignors to Rohm & Haas Co., Philadelphia, both Pa.

2,407,479. **Composition Including the Product of Polymerization of a Mixture of a Polymerizable Unsaturated Alkyd Resin and a Polymerizable Monohydric Alcohol Polyester of an Alpha Unsaturated Beta Polycarboxylic Acid.** G. F. D'Alelio, Pittsfield, Mass. assignor to General Electric Co., a corporation of N. Y.

2,407,494. **Low-Temperature Polymerization of Isoolefins to High Molecular Weight Polymerization Products.** H. Hartvigsen, Scotch Plains, N. J., assignor, by mesne assignments, to Jasco, Inc., a corporation of La.

2,407,566. **Bisdimethylene Thiuram Polysulfides.** R. A. Mathes, Akron, and P. C. Jones, Silver Lake both in O., assignors to B. F. Goodrich Co., New York, N. Y.

2,407,582. **Isoprene Resin as Coating for Synthetic Mineral Fibers on a Resilient Insulating Bat.** F. J. Soday, Swarthmore, Pa., assignor to United Gas Improvement Co., a corporation of Pa.

2,407,599. **Thermosetting Resinous Products Containing Sufonate Groups.** R. W. Auten, Jenkintown, and J. L. Rainey, Abington, assignors to Resinous Products & Chemical Co., Philadelphia, all in Pa.

Dominion of Canada

436,357. **Moldable Fire-Resisting Insulating Composition Including Polystyrene, a Substantially Symmetrically Halogenated Aryl Compound to Provide Fire Resistance, and the Resinous Reaction Product of Maleic Anhydride and Styrene.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of L. J. Berberich and J. Swiss, both of Wilkinsburg, Pa.

436,601. **Non-Fiber-Forming Synthetic Polyamide Intimately Mixed with a Phenol Free from Amide-Forming Groups, Heated with Formaldehyde until Formation of Phenol-Formaldehyde Condensation Product and Further Polymerization of the Polyamide Occur.** Canadian Industries Ltd., Montreal, P. Q., assignee of W. E. Hanford, Wilmington, Del., U.S.A.

436,605. **Modified Oleic Acid Obtained by Contacting Oleic Acid, Ethylene Glycol and Formaldehyde with Sulfuric Acid at a Temperature between —80 and +300° C.** Canadian Industries, Ltd., Montreal, P. Q., assignee of D. J. Loder and W. F. Gresham, both of Wilmington, Del., U.S.A.

436,607. **Preparing a Solid Polymer of Formaldehyde by Evaporating an Aqueous Solution of Formaldehyde to Dryness at below Atmospheric Pressure; the Aqueous Solution Contains a Strong Non-Reactive Acid.** Canadian Industries, Ltd., Montreal, P. Q., assignee of J. F. Walker, Lewiston, New York, U.S.A.

436,610. **Cleaving 4-Methyl-1,3-Dioxane with an Acidic Material and Polymerizing the Cleavage Products with a Friedel-Crafts Catalyst.** Canadian Industries, Ltd., Montreal, P. Q., assignee of R. B. Carlin, Champaign, Ill., and G. T. Vaale, Wilmington, Del., both in the U.S.A.

436,611. **Preparation of Acetals by Reacting Acetylene with a Monohydric Alcohol Ester of Hydroxyacetic Acid under Anhydrous Conditions in the Presence of a Mercury Catalyst.** Canadian Industries, Ltd., Montreal, P. Q., assignee of D. D. Coffman Wilmington, Del., U.S.A.

436,614. **Obtaining Methyl-Gamma-Cyanopropyl Ketone from Acetone Reacted with Acrylonitrile in Equimolecular Proportions at a Temperature from 0 to 100° C. in the Presence of an Alkaline Condensing Agent and a Diluent.** Canadian industries, Ltd., Montreal, P. Q., assignee of O. W. Shannon, Niagara Falls, N. Y., U.S.A.

436,615. **Resinous Reaction Product of Ingredients Including Hydroxyacetic Acid, Polyhydric Alcohol, Polybasic Carboxylic Acid and a Substance from the Group of Linseed Oil, and Linseed Oil Acids.** Canadian Industries, Ltd., Montreal, P. Q., assignee of H. W. Gray, Wilmington Del., U.S.A.

436,616. **Preparing Methyl Methacrylate Monomer from Polymeric Methyl Methacrylate.** Canadian Industries, Ltd., Montreal, P. Q., assignee of B. M. Marks, Newark, N. J., U.S.A.

436,618. **Intimately Incorporating a Zinc Salt of an Aromatic Mercaptan of the Benzene and Napththalene Series with Butadiene-Styrene Elastomer to Improve Processing Characteristics.** Canadian Industries, Ltd., Montreal, P. Q., assignee of J. R. Vincent, Wilmington, Del., U.S.A.

436,619. **Organic Solvent-Soluble 2-Thiazolinylthiomethylcellulose Acetate.** Canadian Industries Ltd., Montreal, P. Q., assignee of W. J. Burjee, Marshallton, Del., U.S.A.

436,673. **Coated Film Obtained from Rubber Hydrochloride Film Placed under Tension and Then Applying a Solution in a Rubber Hydrochoride Solvent of a Benzene-Soluble Copolymer Formed from Vinyl Chloride and Vinylidene Chloride, and Allowing the Solvent to Dissolve the Surface of the Rubber Hydrochloride Film, and Evaporating the Solvent.** Wingfoot Corp., assignee of J. F. Vicent, both of Akron, O., U.S.A.

436,732. **Liquid Adhesive Composition Including Plastic Polymerized Chloroprene Dissolved in an Organic Solvent, Polyvinyl Acetate and a Curing Agent.** B. B. Chemical Co. of Canada, Ltd., Montreal, P. Q., assignee of S. L. Sprague, Westwood, Mass., U.S.A.

United Kingdom

579,074. **Application of Liquid to Filamentary Material.** International Latex Processes, Ltd.

579,096. **Waterproof Plastic Composition.** J. A. Bell and Naamlooze Vennootschap de Bataafsche Petroleum Mij.

579,102. **Catalytic Hydrogenation of Hydrocarbons.** Houdry Process Corp.

579,130. **Reaction Products of Aldehydes and Bis (Diamino Triazinyl) Disulfides.** British Thomson-Houston Co., Ltd.

579,162. **Flexible Films, Filaments, Etc.** Associated Insulated Products, Ltd. (Research Corp.).

579,181. **Treatment of Vinyl Chloride-Vinylidene Chloride Copolymers.** Wingfoot Corp.

579,184. **Thermoplastic Molding Composition Containing Ethyl Cellulose.** Hercules Powder Co.

579,185. **Cellular Products.** United States Ruber Co.

579,197. **Synthetic Resinous Condensation Products.** British Thomson-Houston Co., Ltd.

579 235. **Interpolymerization of 1,3-Butadienes and Methyl Methacrylate.** Imperial Chemical Industries, Ltd.

579,238. **Processing Butadiene Rubbers.** R. B. F. F. Clarke and Imperial Chemical Industries Ltd.

579,242. **Electric Insulation Material.** Standard Telephone & Cables, Ltd., and S. G. Foord.

579,248. **Synthetic Resin Composition.** Distillers Co., Ltd., and J. J. P. Staudinger.

579,250. **Ethyl Cellulose Molding Compositions.** W. H. Moss and W. E. Cowley.

579,340. **Polyester-Amide Compositions for Coating, Impregnating, Adhesive, or Like Purposes.** J. G. Cook, J. T. Watts, and Imperial Chemical Industries, Ltd.

579 352. **Aqueous Dispersions of Reclaimed Rubber.** B. B. Chemical Co., Ltd., L. E. Puddefoot, and K. J. George.

579,353. **Polymerization of Unsaturated Compounds in the Presence of Thiols and Derivatives thereof.** E. I. du Pont de Nemours & Co., Inc.

579,379. **Polymerization of Acrylic Acid Derivatives.** L. Fallows and E. V. Mellers.

579,387. **Bonding of Butadiene Copolymers to Metal.** E. I. du Pont de Nemours & Co., Inc.

579,408. **Methyl Silicon Polymers.** Corning Glass Works.

579,448. **Treatment of Polyvinylidene Chloride.** D. McCreath, L. Wood, and Imperial Chemical Industries, Ltd.

579,459. **Purification of 4-Hydroxycoumarins.** Wisconsin Alumni Research Foundation.

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PRODUCTS

579,462. **Highly Polymeric Substances.** J. T. Dickson.

579,513. **Sulfonyl Guanidines.** American Cyanamid Co.

579,550. **Polyvinyl Compositions for Coating Sheet Materials.** J. H. McGill and Imperial Chemical Industries, Ltd.

579,666. **Polymerization and Interpolymerization of Ethylene.** J. S. A. Forsyth and Imperial Chemical Industries, Ltd.

579,675. **Manufacture of n-Butyl Vinyl Ether.** W. J. R. Evans and Imperial Chemical Industries, Ltd.

579,676. **Polymerization and Interpolymerzation of Ethylene.** J. S. A. Forsyth and Imperial Chemical Industries, Ltd.

579,698. **Manufacture of Thermosetting Synthetic Resins by the Polymerization of Alkylene Oxide Derivatives.** Soc. Anon. de Trey Freres.

579,715. **Vinyl and Ethylidene Esters.** E. I. du Pont de Nemours & Co., Inc.

579,769. **Powdered Polythene.** K. B. Jarrett and Imperial Chemical Industries, Ltd.

579,786. **Colored Synthetic Resin Articles.** W. E. F. Gates and Imperial Chemical Industries, Ltd.

579,787. **Refining Crude Acrylonitrile.** American Cyanamid Co.

579,855. **Acrylic Acid and Its Esters.** N. Short and Imperial Chemical Industries Ltd.

579,857. **Curing Polymeric Materials.** J. G. Cook, R. C. Seymour, and Imperial Chemical Industries, Ltd.

579,868. **Dielectric Composition.** Taylor, Tuncliff & Co., Ltd., and W. Vose.

MACHINERY

United States

2,406,093. **Tire Building Apparatus.** E. Miller, Jeannette, Pa.

2,406,297. **Apparatus For Reclaiming Waste Rubber.** A. Johnston, assignor to North British Rubber Co., Ltd., both of Edinburgh, Scotland.

2,406,455. **Cable Vulcanizing Unit.** C. D. Davidson, Washington, Pa.

2,406,498. **Device for Repairing Tire Casings.** H. V. James, Denver, Colo.

2,406,589. **Molding Apparatus.** M. M. Cunningham, South Bend, assignor to Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, both in Ind.

2,406,738. **Apparatus to Stiffen Shoe Uppers in Which Resinous Stiffening Material Is Incorporated.** J. J. Brophy, Salem, Mass., assignor to United Shoe Machinery Corp., Flemington, N. J.

2,406,742. **Mold for Use in the Formation of an Optical Element of Polymerized Synthetic Plastic Material.** D. P. Cooper, Jr., assignor to Polaroid Corp., both of Cambridge, Mass.

2,407,335. **Apparatus for Smoothing Thermoplastic Coating Material.** A. M. Wickwire, Jr. Great Barrington, Mass., assignor to Interchemical Corp., New York, N. Y.

2,407,354. **Machine to Cover Wires with Strips of Organic Resin Insulation.** G. H. Walton, J. C. Quayle, both of Helsby, and P. Jones, Kelsall, assignors to British Insulated Cables, Ltd., Prescot, all in England.

2,407,495. **Apparatus for Welding Sheets of Thermoplastic Material for Inner Soles.** Le R. B. High and G. C. T. Lindh, assignors to Udylite Corp., all of Detroit, Mich.

2,407,503. **Machine for Plasticizing and Extruding Thermoplastic Materials.** W. A. Magerkurth and H. E. Buecken, assignors to National Rubber Machinery Co., all of Akron, O.

Dominion of Canada

436,419. **Apparatus for Simultaneously Stretching Plastic Films Longitudinally and Transversely.** Sylvania Industrial Corp., assignee of A. O. Russell, both of Fredericksburg, Va., U.S.A.

436,612. **Extruder.** Canadian Industries, Ltd., Montreal, P. Q. assignee of R. T. Fields, Arlington, N. J., U.S.A.

436,613. **System for Melting Filament-Forming Polyamides.** Canadian Industries, Ltd., Montreal, P. Q., assigned of R. T. Fields, Arlington, N. J., U.S.A.

UNCLASSIFIED

United States

2,405,954. **Drop Center Wheel for Pneumatic Tires.** C. Hollerith, Jackson, Mich., assignor, by mesne assignments, to B. F. Goodrich Co. Akron, O.

2,406,488. **Coupling Device for Pipes or Tubes.** W. H. J. Brock, assignor of one-half to Automotive Products Co. Ltd., both of Leamington Spa, England.

2,406,676. **Cable Joint.** A. F. Gambitta, Jersey City, N. J., assignor to Phelps Dodge Copper Products Corp., Dover, Del.

2,406,805. **Cable Connection.** T. H. Clark New York, N. Y., assignor to Federal Telephone & Radio Corp., a corporation of Del.

2,406,989. **Device for Testing the Tack of Coatings.** R. E. Bonner, Stamford Conn., and M. D. Brewster, assignors to Atlas Powder Co., both of Wilmington, Del.

2,407,049. **Tire Inflation Guard.** N. and B. Winarsky, assignors to Belmont Body Builders, all of Newark, N. J.

2,407,233. **Insulated Wire Stripper.** J. J. Greer, Conimicut, and A. Luongo, Wickford, both in R. I.

2,407,423. **Wheel and Brake Assembly.** C. Hollerith, Jackson, Mich., assignor, by mesne assignments, to B. F. Goodrich Co., Akron, O.

2,407,473. **Device for Protecting a Tire Mounted on a Vehicle Wheel.** W. C. Carlton, Ilford, England.

2,407,583. **Apparatus for Testing the Compressible Hardness of Resilient Sheet Material.** E. A. Spriggs, Wadsworth, O., assigner to B. F. Goodrich Co., New York, N. Y.

TRADE MARKS

United States

422,730. **Toddle-Moc.** Footwear. Rasmussen Shoe Co., Westboro, Mass.

422,732. **Bristolite.** Footwear. Bristol Mfg. Corp., Bristol, R. I.

422,735. **Vanity.** Foundation Garments. Vanity Corset Co., Inc., New York, N. Y.

422,736. Representation of an oval containing the words: **"Beebe Bros."** Footwear. Beebe Bros. Rubber Co., Nashua, N. H.

422,737. Representation of a top containing the words: **"All-Top Tops In Rubber."** Footwear. Wright & Crowly, New York, N. Y.

422,739. **Parasolv.** Agent for removal of resins. Foundry Rubber Compounds Corp., Washington, D. C.

422,743. **Panacea.** Machinery packing. Prince Rubber Co., Inc., Buffalo, N. Y.

422,745. Representation of two palm trees and the word: **"Palmettes."** Footwear. Allied Mfg. & Trading Co. Pittsburgh, Pa.

422,753. **Empire.** Rubber pants. Empire Shield Co., Inc., New York, N. Y.

422,786. **Biflex.** Foundation garments. Arista Foundations, Inc., New York, N. Y.

422,788. **Low Tide.** Footwear. Town & Country Shoes, Sedalia, Mo.

422,802. **Silver Spray.** Garden hose. B. F. Goodrich Co., New York, N. Y.

422,913. A representation of the globe enclosed in a retort with the letters: **"RCI"** across it. Resins. Reichhold Chemicals, Inc., Detroit, Mich.

422,922. **Vitafilm.** Film for packaging. Goodyear Tire & Rubber Co., Akron, O.

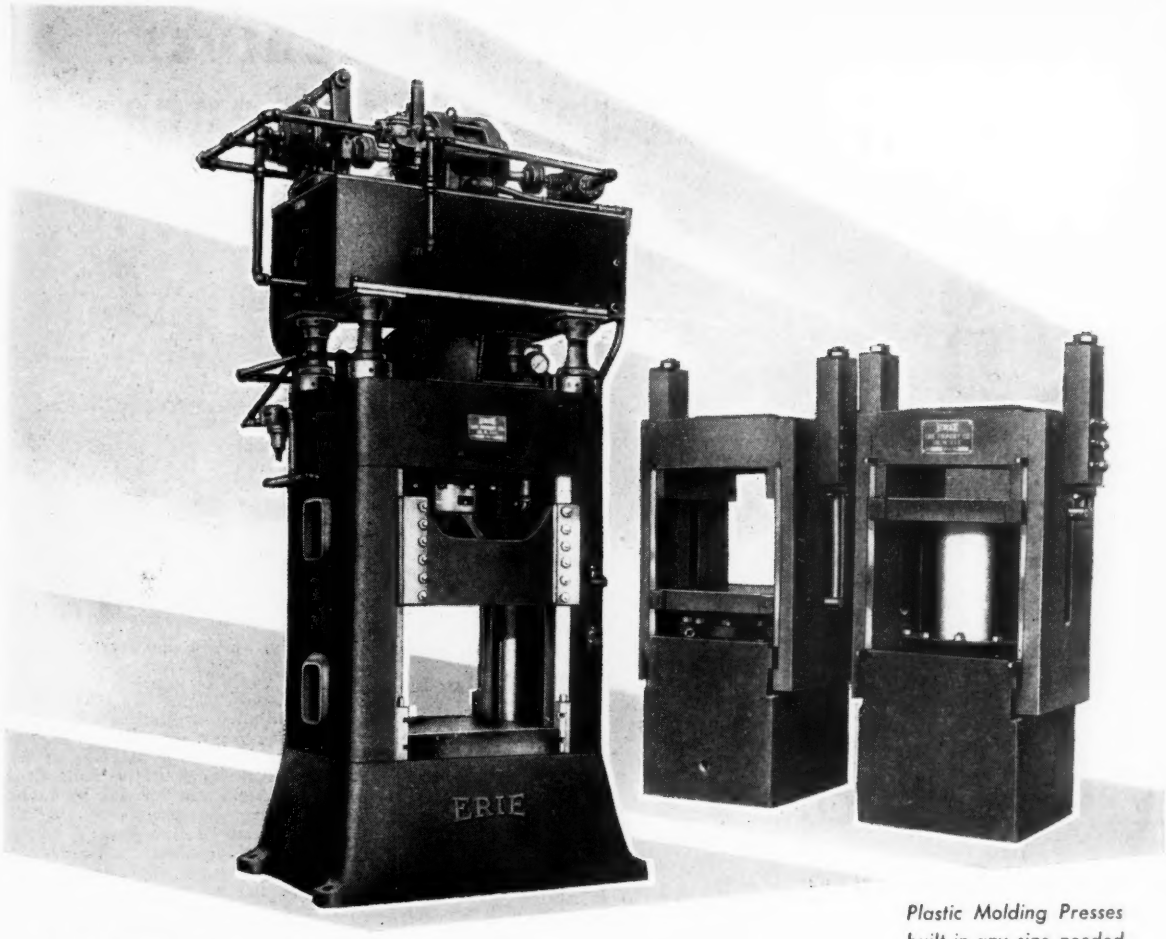
Fixed Government Prices*

	Price per Pound	
	Civilian Use	Other Than Civilian Use
Guayule		
Guayule (*carload lots*)	$0.17½	$0.31
Latex		
Normal (*tank car lots*)	.26	.43½
Creamed (*tank car lots*)	.26¾	.44¼
Centrifuged (*tank car lots*)	.27¾	.45¼
Heat-Concentrated (*carload drums*)	.29½	.47
Plantation Grades		
No. 1X Ribbed Smoked Sheets	.22½	.40
1X Thin Pale Latex Crepe	.22½	.40
2 Thick Pale Latex Crepe	.22	.39½
1X Brown Crepe	.21⅜	.38⅞
2X Brown Crepe	.21⅛	.38⅝
2 Remilled Blankets (Amber)	.21¼	.38¾
3 Remilled Blankets (Amber)	.21⅛	.38⅝
Rolled Brown	.18	.35½
Synthetic Rubber		
GR-M (Neoprene GN)	.27½	.45
GR-S (Buna S)	.18½	.36
GR-I (Butyl)	.18½	.33
Wild Rubber		
Upriver Coarse (crude)	.12⅝	.26¼
(washed and dried)	.20¼	.37¾
Islands Fine (crude)	.14⅝	.28¼
(washed and dried)	.22½	.40
Caucho Ball (crude)	.11⅝	.24¼
(washed and dried)	.19½	.37
Mangabiera (crude)	.08½	.19¾
(washed and dried)	.18	.35½

* For a complete list of all grades of all rubbers see Rubber Reserve Co. Circular 17, p. 169, May, 1943, issue.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Anaconda Wire & Cable Co.	Com.	$0.25	Oct. 21	Oct. 11
Baldwin Rubber Co.	Com.	0.17½	Oct. 22	Oct. 15
Boston Woven Hose & Rubber Co.	Com.	1.75 extra	Jan. 2	Nov. 15
Boston Woven Hose & Rubber Co.	Com.	0.50 q.	Nov. 25	Nov. 15
Dayton Rubber Mfg. Co.	1st Pfd.	0.16⅔ init.	Oct. 10	Oct. 1
Dayton Rubber Mfg. Co.	2nd Pfd.	0.13⅓ init.	Oct. 10	Oct. 1
Dayton Rubber Mfg. Co.	Com.	0.20	Oct. 25	Oct. 10
Dayton Rubber Mfg. Co.	Pfd. "A"	0.50 q.	Oct. 25	Oct. 10
Detroit Gasket & Mfg. Co.	Com.	0.25	Oct. 25	Oct. 10
DeVilbiss Co.	Com.	0.25	Oct. 21	Oct. 10
Dunlop Tire & Rubber Goods Co., Ltd.	5% 1st Pfd.	2½%	Dec. 31	Dec. 16
Firestone Tire & Rubber Co.	4½% Pfd.	1.12½ cum. q.	Dec. 1	Nov. 15
Firestone Tire & Rubber Co.	Com.	1.00 extra	Nov. 20	Nov. 5
General Cable Co.	1st Pfd.	1.00 init.	Oct. 1	Sept. 26
General Cable Co.	2nd Pfd.	0.50	Oct. 1	Sept. 26
Goodyear Tire & Rubber Co., Inc.	Com.	1.00 incr. q.	Dec. 16	Nov. 15
Goodyear Tire & Rubber Co., Inc.	Com.	1.00 extra	Dec. 16	Nov. 15
Goodyear Tire & Rubber Co., Inc.	Pfd.	1.25 q.	Dec. 16	Nov. 15
Gro-Cord Rubber Co.	Com.	0.10 q.	Sept. 28	Sept. 18
Lee Rubber & Tire Corp.	Com.	0.50 q.	Oct. 28	Oct. 15
Okonite Co.	Com.	1.00 q.	Nov. 1	Oct. 18
A. G. Spalding & Bros., Inc.	Com.	0.70 extra	Oct. 15	Oct. 8
A. G. Spalding & Bros., Inc.	Com.	0.40 s.	Dec. 16	Dec. 6
Thermoid Co.	Pfd.	0.62½ q.	Nov. 1	Oct. 25
Union Asbestos & Rubber Co.	Com.	0.17½ q.	Jan. 2	Dec. 10
S. S. White Dental Mfg. Co.	Com.	0.10 extra	Nov. 12	Oct. 28
S. S. White Dental Mfg. Co.	Com.	0.35 q.	Nov. 12	Oct. 28



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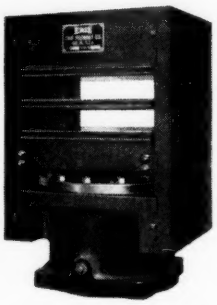

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New Machines and Appliances

Campbell Model 72 for Cutting Rubber and Plastic Tiling

Tile Cutting Machine

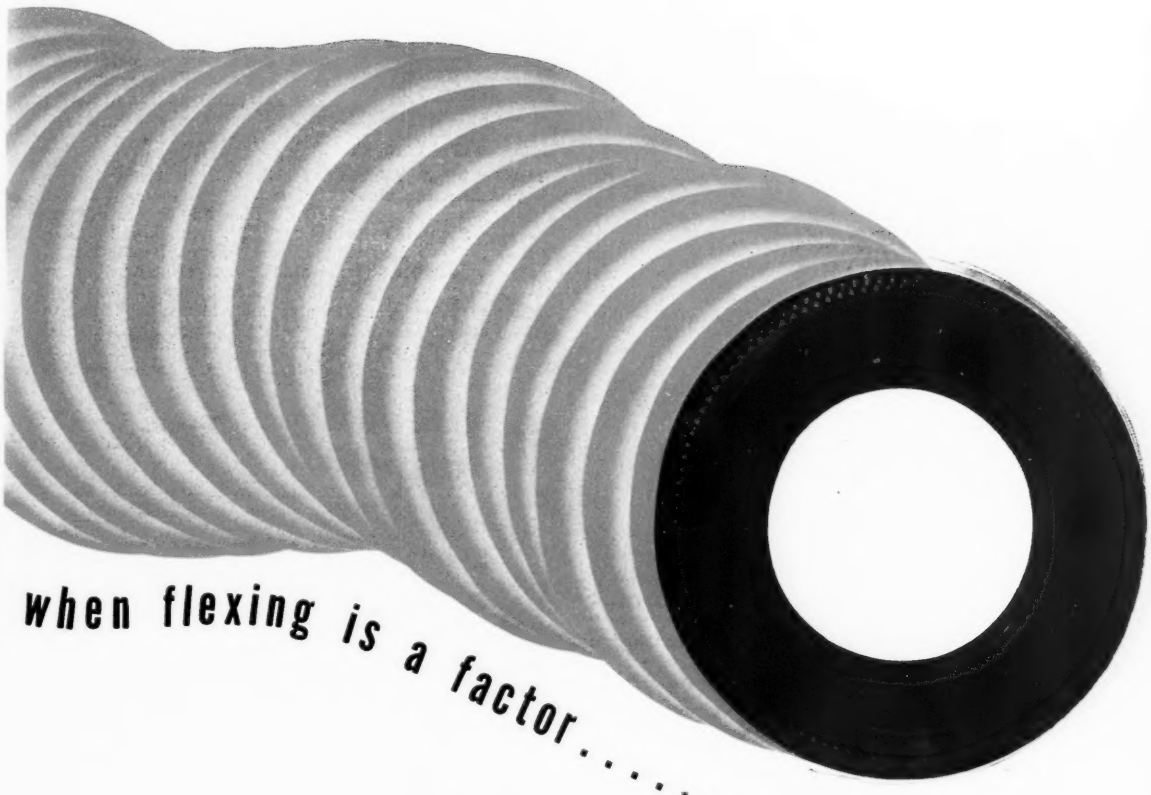
A MACHINE which cuts floor tiling into blocks four inches square up to 24 inches square, in graduations of one inch, has been developed by the Campbell Machine & Development Co. and is being manufactured by the Falls Engineering & Machine Co. Built specifically for use by rubber tile and plastic tile manufacturers, the machine is also expected to be valuable to large volume flooring dealers.

The Campbell Model 72 rubber floor tiling cutting machine will take a sheet with a maximum width of 72 inches. The tiling is placed on the bed of the machine, and electrically operated rollers move the stock into position under a cutting bar. The bar clamps the sheet in position while a power-driven knife head cuts the tile into the size required. The machine will also cut oblong blocks within the four-inch to 24-inch square range and, in tests, has cut tile up to ¼-inch in thickness. It will take either roll or block tile and will cut feature or border strips to a maximum of six feet in length.

The company states that delivery can be made in 20 to 24 weeks after receipt of order. The company is also preparing to build two other models: Model 54 to accommodate tiling up to 54 inches wide; and Model 42 to take sheets up to 42 inches wide. Both machines will cut square and oblong blocks in the same-size range as the Model 72.

FOR LOW HEAT BUILD-UP, USE PHILBLACK A

FOR FURTHER DETAILS, SEE AD ON PAGE 160



when flexing is a factor.....

USE MONSANTO LAMPBLACK

99.29% Pure (Typical Free Carbon Analysis)

Any opportunity to cut friction and thereby cut heat "build-up" in rubber is all-important to manufacturers of either the natural or synthetic product.

That's why Monsanto Lampblack No. 10 is being specified by producers today. This formulation of precision-made Monsanto lampblack has demonstrated a *maximum degree of purity and carbon content and virtually complete freedom from empyreumatic matter.* That means less friction and consequently longer rubber life, especially where flexing is encountered. (In an automobile tire, for example, it is estimated that in 20,000 miles 15 million flexings of the tire occur!)

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

Manufacturers likewise favor the good blue-gray undertone this Monsanto Lampblack No. 10 provides.

If you would like to investigate Monsanto Lampblack No. 10 thoroughly, ask for trial samples, or Monsanto technical reports on this popular material. Write, wire, or phone: MONSANTO CHEMICAL COMPANY, 30 Rockefeller Plaza, New York 20, N. Y.

LITTLEJOHN & CO., Inc.
120 WALL STREET
NEW YORK 5, N. Y.

CRUDE & SNYTHETIC RUBBER
NATURAL & SYNTHETIC LATEX

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All Grades of
Brazilian & Far Eastern
Chewing Gum Raw Materials

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"COTTON FLOCKS"
does not mean cotton fiber alone

EXPERIENCE
over twenty years catering to rubber manufacturers

CAPACITY
for large production and quick delivery

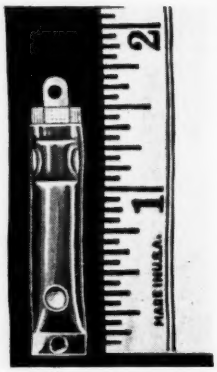
CONFIDENCE
of the entire rubber industry

KNOWLEDGE
of the industry's needs

QUALITY
acknowledged superior by all users are important and valuable considerations to the consumer.

Write to the country's leading makers for samples and prices.

CLAREMONT WASTE MFG. CO.
CLAREMONT N. H.
The Country's Leading Makers

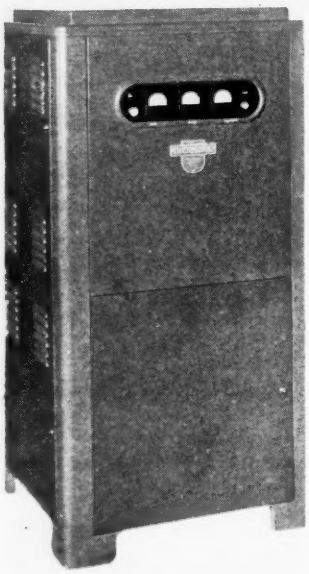


"Mighty Mite" Thermostat, Showing Size

Miniature Thermostat

NEWEST of the miniature thermostats to hit the electrical field is "Mighty Mite," a perfectly sealed thermostat made by Mechanical Industries Production Co., which is especially designed in size and shape for molding in rubber and many plastics. Built to withstand the toughest kind of treatment without changing its temperature setting, the "Mighty Mite" is preset to the customer's temperature specification, has ⅛-inch silver contacts, and is custom engineered to give extra safety and heat control accuracy. The standard model is preset for fixed temperatures up to 300° F., but other models are available for settings up to 600°.

Small, thin, durable, and lightweight, "Mighty Mite" not only is tamperproof, but also dust- and waterproof. The copper jacket has high thermal conductivity, making the thermostat highly responsive to temperature changes. By the use of fibreglass insulation, neither humidity nor freezing weather can affect its consistent operation. The sealed tubular construction withstands great external pressure and will neither bend nor break, in contrast to thermostats using stamped or assembled cases. The standard model is designed for use up to 300 watts, 110 volts or 150 watts, 220 volts AC non-inductive load. One of the thermostat's most important construction features is the oversize (⅛-inch), cold-headed, spun-in silver contacts which result in very noticeably slower let-down of temperature change and greatly lengthening the life of the thermostat.



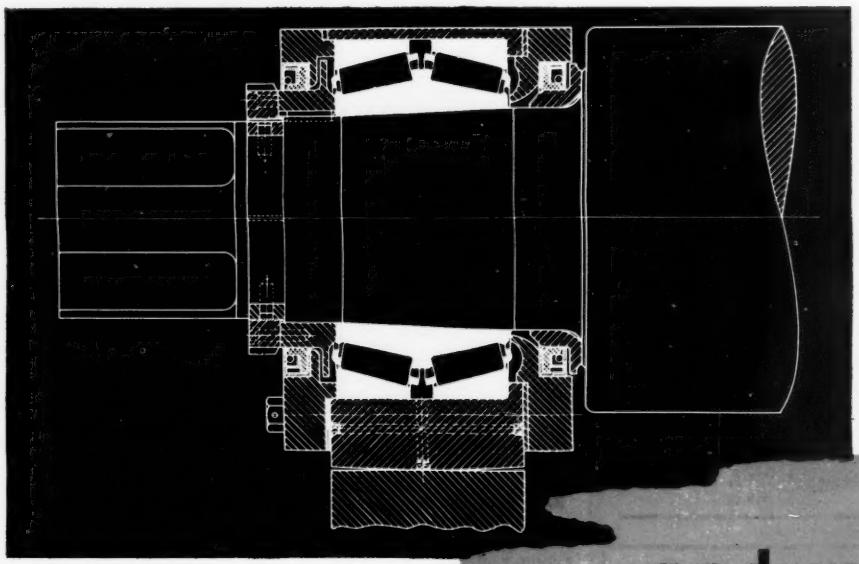
Ther-Monic Combination Induction and Dielectric Heater

Combination Heater

THE Ther-Monic M-285C electronic heating generator, a single, dual-purpose unit suitable for both induction (metal) and dielectric (non-metal) heating operations, was recently developed by the Induction Heating Corp. Especially designed for use in experimental laboratories, testing depots, and development research departments, this combination induction and dielectric heating generator is provided with two separate, interchangeable oscillator sections, one for each type of heating. Changeover from one heating system to the other is accomplished by removing one oscillator section and replacing it with the other. The induction oscillator feeds into a radio-frequency output transformer, while the dielectric oscillator feeds through coaxial cables to heating electrodes. The unit is a high-frequency generator operating on 205-245 volts, 60-cycle, single-phase power supply, and having a full-load input of 12 KVA at 90% power factor. Its full-load output is 285 B.T.U. per minute, or approximately five kilowatts at nominal frequencies of 375,000 cycles a second for induction heating and 20,000,000 cycles a second for dielectric heating. The tube complement of the unit comprises two mercury-vapor rectifiers and one water-cooled oscillator.

Developed to meet the need of laboratories for a rapid and dependable source of heat for a wide variety of heating applications, this new unit is suitable, when operating as an induction heating unit, for thin case-hardening, heat treating, thorough hardening, brazing, forging, melting and soft soldering. When operating as a dielectric heating unit, it efficiently

PUT THIS BEARING ON YOUR *Calender Rolls*



and watch performance improve

With the new Timken DIT Type Balanced Proportion Bearings on the roll necks of your rubber and plastics calenders you will get greatly increased roll neck rigidity with minimum roll deflection under all load conditions because these bearings make possible larger, stronger roll necks plus maximum radial, thrust and combined load capacity.

Result, accurate product control; lower operating cost; reduced maintenance; extended equipment life.

Note the simplicity of the bearing mounting; this makes it much easier to assemble the bearings on the roll necks and to remove them when necessary.

For specific information covering the application of Timken Balanced Proportion Bearings to your calenders consult the calender builder or our engineers. The Timken Roller Bearing Company, Canton 6, Ohio.

LOOK for the trade-mark "TIMKEN" on every bearing that goes in your equipment.

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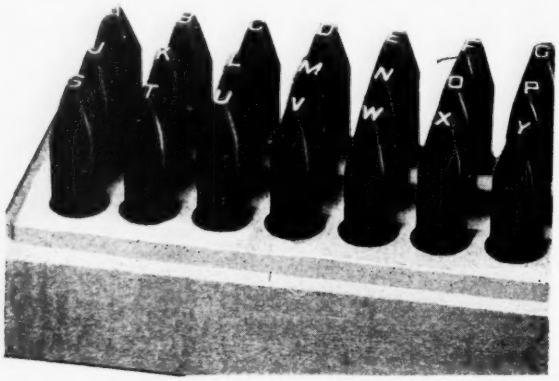
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

HOGGSON BRAND Since 1849 STEEL LETTERS

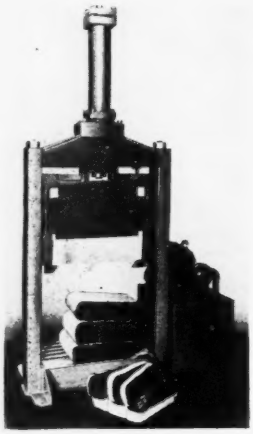
FIGURES, STAMPS
MADE IN REVERSE FOR MARKING
MOLDS AND DIES

Individual letters, figures, symbols, lines of lettering and trade mark designs supplied in "reverse" for stamping molds for making plastic, rubber and glass products. Made for marking flat surfaces or to conform to various contours. Write for details, explaining your problem.



THE HOGGSON & PETTIS MFG. CO.
141S. Brewery St., New Haven 7, Conn.

CRUDE RUBBER BALE CUTTER



Complete Unit

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High Production

An efficient machine of simple design for cutting bales of crude, synthetic and reclaimed rubber or similar materials. Cuts without aid of water or other lubricant. One man operation—safety control.

SPADONE MACHINE COMPANY
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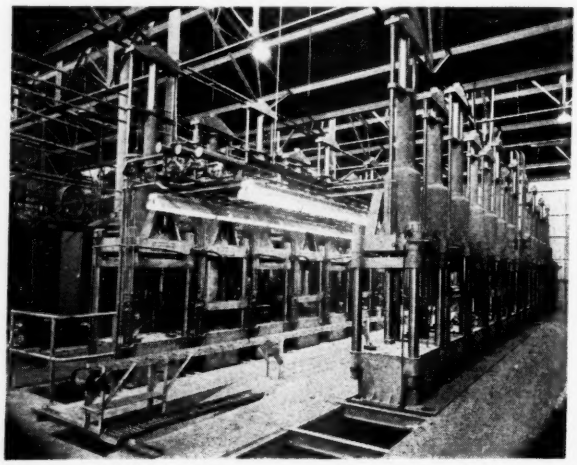
heats non-conducting materials. Rubber curing, preheating and polymerizing of plastics, wood gluing and laminating, textile processing, food dehydrating, sterilization and deinfestation of packaged foods, and foundry core baking are but a few of the applications for this unit. The generator weighs, 1,400 pounds and is 36 inches wide, 28 inches deep, and 62½ inches high.



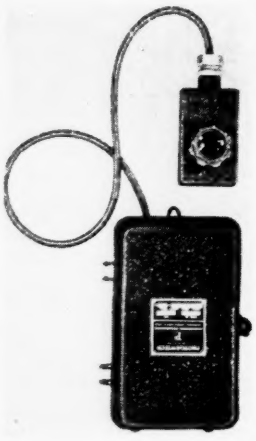
Merriman Photo Art

Battery of Pomona Hydraulic Presses with Downward Acting Rams Installed at Stauffer Chemical Co.

Hydraulic Molding Presses

TWO models of hydraulic molding presses are available for quick delivery from the Pomona Machine Works. Made in sizes up to 300 tons, the presses are especially designed for non-metallic molding. The first model has a downward acting ram, with the pull-back cylinder and ram at the top of the press. The second model has an upward acting ram, with the pull-back cylinder either at the bottom or at the top of the press, and can be provided with both if desired.

The presses are semi-automatic in operation. The mold remains in the press, and the operating cycle may be established in advance of the actual operation. The press therefore closes, breathes, cures, and knocks out automatically. Starting, opening, and loading the mold cavities are the only functions of the operator. Furnished with or without knock-out cylinders, pumping units, or accumulators, both presses are made to customers' specifications. In addition, the company makes special-duty presses for individual applications.



Photoswitch Series 20 and 21 Photoelectric Controls

Industrial Controls

PHOTOSWITCH Series 20 and 21 photoelectric controls, rugged and efficient high-speed units designed for general industrial and machinery applications, have been announced by Photoswitch, Inc. The controls are particularly recommended for such applications as counting, conveyer control, short-range signal systems, motor or valve control, production inspection, machinery safeguards, stop-motion control in the textile, paper, and wire industries, as well as automatic control for hundreds of specialized industrial processes.

The phototube, which must be placed at the point where operations are being observed, is available either integral with the housing or in a small separate housing. This latter permits the use of

(Continued on page 264)

ACCELERATORS
PLASTICIZERS
ANTIOXIDANTS

A Complete Line of Approved Compounding Materials

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CHEMICAL MANUFACTURERS

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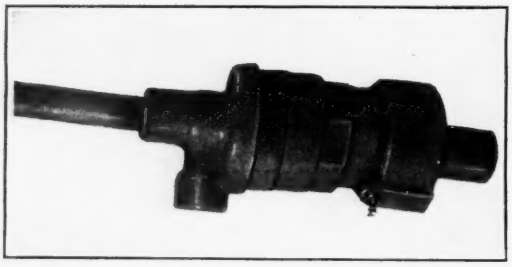

SWING and BALL JOINTS...

—for use on rubber and plastic molding presses. Especially constructed to offset expansion and contraction caused by sudden change from high pressure steam to cold water. Permanently ends leaking nuisance. Ball joints recommended to correct misalignment in any hook-up.

REVOLVING JOINTS (Illustrated)

—are made in a complete range of sizes from 1" to 2½" roll connections for use on rubber mills, mixers or any other steam heated or water cooled roll. Patented construction prevents leaking. Specially compounded molded gasket lasts 14 months on average in severe service—easy, quick and inexpensive to replace—no tight packing to act as brake on roll.

Bulletin and Prices upon request

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Porcelain GLOVE FORMS

—for dipped rubber gloves, including household, industrial, linemen's or electricians' and surgeons' gloves. Some are made from our own stock molds and others from customers' molds.

Write today for our new catalog covering rubber glove and other forms for dipped rubber goods. Prompt attention given to requests for quotations based on your specifications or stock items.

The Colonial Insulator Co.

993 Grant Street Akron 11, Ohio

New Goods and Specialties

Perky the Pup, Chubby the Pig, Squawky the Duck, and Hoppy the Rabbit

Rubber Squeeze-Me Toys

THE Oak Rubber Co., Ravenna, O., recently introduced its new line of Squeeze-Me Toys, dipped rubber latex toys containing a rubber whistle. They include a pup, rabbit, pig, and duck, and are considered by the trade as "crib toys." As such, each toy is individually wrapped in cellophane to keep it sanitary and attractive. Bright yellow with appropriately colored eyes, nose, and mouth, the toys are cute and colorful. Popular with children in the crib, and older, the new toys are in great demand and will be sold to syndicate organizations and released through the toy jobbers as fast as production warrants.

Sponge Mop

NEWS in household work-savers is a self-wringing mop with sponge head of neoprene synthetic rubber, made by the Spartan Co., Minneapolis, Minn. Soft and close-grained, yet tough, the sponge is an efficient scrubber, and its compact oblong shape makes the mop easy to push over the floor. Messy dripping is eliminated because the large sponge is very absorbent, holding more than a pint of water. This high absorbency also aids in drying the floor after rinsing.

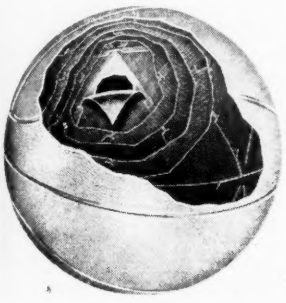
New Neoprene Sponge Household Mop

The new mop has a simple self-wringing device which obviates the necessity of getting the hands watersoaked. The sponge is fitted on a metal bracket with rods running through lengthwise. A knob at one end of the bracket is pulled to contract the sponge and squeeze out the water, thus greatly simplifying the operations of wetting, soaping, and rinsing the mophead.

The neoprene mophead resists abrasion and will not be harmed by grease from the floor. The sponge rinses clean of dirt and does not shrink or get hard when dry. It can be flipped over to double the life.

In addition to washing floors, windows, and painted walls, the mop may be used to clean surface dirt from pile rugs,

When dry or slightly moistened, it effectively picks up dust, lint, dog hairs, and other small particles. The mop is attractively styled, with red handle, red pull-knob for wringing, and cameo-type decoration on the nickel-plated ferrule. A metal ring for hanging is firmly attached to the handle.



Cutaway of Sunruco Arrow Basketball Showing Construction

Rubber-Covered Athletic Balls

A COMPLETE line of rubber-covered athletic balls, originally designed for the Armed Forces' rugged recreational program, is now on the civilian market, according to T. W. Smith, Jr., general manager of the Sun Rubber Co. The six balls, known as the Sunruco "Arrow" line, include two basketballs, a football, volley ball, soccer ball, and a water polo ball.

The balls, it is claimed, are not affected by bad weather, and will not rot, mildew, or become water-logged. They have no stitches to pull out and no laces, and tests have shown that the balls keep their shape without stretch or shrinkage even when exposed to adverse weather for a long time. The basic reason for this ability to withstand abuse is the Sunruco Vita-Weld construction. This construction is similar in principle to the construction of a tire and consists of four major parts: (a) a high-quality molded rubber bladder specially compounded for long air-retaining ability; (b) rubber-impregnated, square-woven fabric plies; (c) a patented process using bias-cut tape reinforcements for maximum strength; and (d) a tough, long-wearing rubber cover. When these parts are vulcanized, they bond together firmly to form a strong, cohesive one-piece unit.

Another design feature is a patented chamber called the Sunruco pressure-seal chamber. This rubber chamber is filled with the same material used in wartime bullet-sealing tubes and tanks. An inflation needle is inserted through the rubber plug in the ball's cover. The needle passes through the sealing material, through the wall of the chamber, and into the air chamber. The ball is then inflated in the usual manner, and when the needle is pulled out, the pressure is sealed instantly.

..why guess?

Guessing can be hard on your pocketbook in rubber processing, too. Improper temperatures in working rubber can cost plenty. But why guess temperatures? Use the Cambridge Surface Pyrometers throughout the plant. These accurate, rugged, quick-acting instruments are so easy to use workers will use them. The roll model is for checking surface temperature of still or moving rolls. The needle type for within-the-mass temperature. The mold type for surface temperature of mold cavities. Send for bulletin 194-SA.

Roll Model

CAMBRIDGE
Roll • Needle • Mold
PYROMETERS

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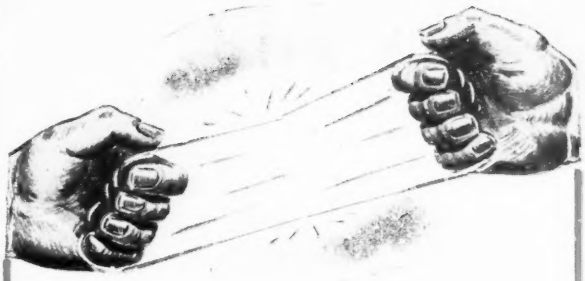

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INSURES THE FOOLPROOF FORMULATION OF GOOD-AGING, ALL-SYNTHETIC, LIGHT-COLORED —

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machined in a large modern shop at low prices by specialists in the field. We also build special machinery to your drawings.

Submit inquiries for low quotations.

THE AKRON EQUIPMENT CO.
AKRON - OHIO

VALVAIR WON'T LEAK AFTER *Millions* OF OPERATIONS!

Diagram shows double-acting air cylinder operated by Valvair lever-operated 4-way valve.

Exclusive Features

Sensational performance? Perhaps; certainly thoroughly proven, thoroughly dependable; over 2,000,000 operations at 100 lbs. pressure and still going strong. Non-corrosive—cast bronze body, stainless steel parts; no metal seats to cause trouble; full pipe area utilized with minimum pressure drop. *A Valvair for every need:* 3 types, 8 designs, 5 sizes (⅛" to 1").

Ask for our Catalog "A-W" or a Valvair representative

VALVAIR CORPORATION • 454 Morgan Avenue, Akron 11, Ohio

Valvair
2-WAY 3-WAY 4-WAY

Shortages of materials and skilled labor are making it difficult to fill all the orders that are pouring in for these new Arrow balls, and the company is therefore accepting and shipping orders on an allocation basis.

Tire for Shuttle Cars

A NEW pneumatic tire for use on shuttle cars and other equipment used in underground mine service has been announced by The B. F. Goodrich Co., Akron, O. The tire has been specially designed for the severe demands of mine operation, with round shoulders and extra-thick sidewalls to protect it from snagging and cutting. It has two-way traction, necessary as shuttle cars operate in both directions. In developing the tire, company engineers studied mine conditions and held discussions with superintendents to learn exactly what service requirements had to be met. The tire is at present being produced in several sizes, including 7.50-15 ten-ply, the most popular size for this service. Maximum load for this tire is 4,340 pounds at five miles per hour, 3,880 pounds at 10 m.p.h., and 2,530 pounds at 30 m.p.h. Two other popular mine tire sizes, 8.25-15 and 10.00-15, give a complete range for this type of service.

Industrial Controls

(*Continued from page 260*)

the control where space is limited. A tamper-proof sensitivity adjustment is provided on the control housing to permit positive operation over varying distance between phototube and light source. The simplicity of installation is enhanced by having a single set of terminal board connections in the control to provide the supply current for the light source, which requires only low voltage wiring to the board.

Series 20 and 21 photoelectric controls have been designed to provide completely reliable and continuous operation. The control is impervious to moisture and designed to give unlimited life under conditions of extremely high temperature and humidity. Hermetically sealed, oil-filled condensers and high wattage resisters are used throughout. The control is rugged, vibration-proof, simple to install, and has a weight of 11 pounds. The relay operates in 1/20-second, and the operating range is 20 feet. The sensitivity adjustment provides for relay operation at any predetermined level of illumination within the range of 10 to 50 foot candles. The controls operate on 115 or 230 volts, 50 to 60 cycles AC current, and have double-pole, double-throw relays with pure silver contacts. Maximum ratings are 10 amperes at 115 volts and five amperes at 230 volts, with ½ h.p. non-inductive with both poles in parallel.

Bolivian Rubber Exports

Bolivia exported 4,094.6 metric tons of crude *Hevea* and *Castilloa* rubber during 1945, against 3,552.6 metric tons in 1944. The United States took 3,329 metric tons of *Hevea* and 442.6 tons of *Castilloa* in 1945, against 3,063.1 and 147.1 tons, respectively, in 1944; Argentina's share was 241.9 tons of *Hevea* and 81.1 *tons* of Castilloa in 1945 and 330.2 tons of *Hevea* and 6.8 tons of *Castilloa* in 1944. In the latter year 5.4 tons of *Hevea* were also sent to focal points.

"Du Pont Color Conditioning for Industry." E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. 32 pages. This illustrated booklet describes the fundamental principles on which color conditioning is based. The safety color code for industry is outlined, and color conditioning is shown at work in the plants of various companies.

EUROPE

GREAT BRITAIN

Free Market for Rubber?

The possibility of an early return to a free market both in England and in Malaya is being widely discussed here. Certainly the increasing amounts of rubber produced in the Far East seem to justify the expectation that controls may be removed by the beginning of next year.

Recently F. D. Ascoli, chairman of the Rubber Growers' Association, announced that his organization had decided to press the Board of Trade for the return to a free market as soon as the present agreement between the Government of the United States and the Governments of the United Kingdom, Netherlands, and France, covering sales to America, ends on December 31, 1946. Importation of synthetic rubber into the United Kingdom had ceased, he pointed out, and manufacturers were expected to have exhausted existing stocks of synthetic by October, after which natural rubber only would be used for tires in the United Kingdom.

Incidentally, certain rubber producers are already considering the possible outlets for surplus natural rubber. The chairman of the Waterfall (Selangor) Rubber Estates, of Malaya, is one of these, and he expressed the opinion that outside of tires there was only one application of rubber that gave even the slightest indication of large-scale development, latex sponge material for mattresses and upholstery. He suggested that the plantation industry might find itself producing "mattresses for the millions," in order to find a market for surplus natural rubber. At present the rubber industry still depends on motor transportation, he stressed, and urged greater standardization of sizes of tires to cut prices and encourage the further development of road transportation.

Disposal of German Patents

A conference attended by representatives of varied Allied nations including Australia, Belgium, Canada, Czechoslovakia, Denmark, France, Luxemburg, Netherlands, Norway, the United Kingdom, and the United States was held in London recently to consider the disposal of German-owned patents. All present agreed that under no circumstances should any such patents within their territories revert to the former German holders. But the question as to how these rights should be disposed of was not definitely settled. The representatives of France, Netherlands, the United Kingdom, and the United States signed an accord making all patents of former German ownership now controlled by their governments and in which there was no non-German interest existing on August 1, 1946, available within their respective territories to all nationals of the countries party to the accord without payment of royalties or without obligation to manufacture within the country where the patents exist. Before the accord can go into effect, at least three more countries will have to sign, and that before the end of 1946.

Dunlop Aids Research

Dunlop Rubber Co., Ltd., recently made two more grants for research work at Scientific Institutions. The first contribution, for £350 net per annum for seven years, was to the department of colloid science at the University of Cambridge for research work on molecular structure. The department during the last two years has been doing research work for Dunlop on the structure of natural and synthetic rubber molecules and the changes occurring in vulcanization. G. B. B. M. Sutherland, a pioneer and world authority on the use of infrared spectroscopy, is to continue research work, which under the new scheme will probably also include ultra-violet and ultra-short wave radio technique.

The second grant, of £1,000 a year, less tax, for seven years also, has been made to help the Royal Institution and its Davy Faraday Research Laboratory to renew and extend their research activities.

Save Time and Money
Reduce Scrap and Improve Quality

DC mold release emulsion *No. 35*

THE DOW CORNING SILICONE RELEASE AGENT

Many of the major rubber companies are changing to DC Mold Release Emulsion No. 35.

★ **It does not build up on mold surfaces**
Cost of cleaning molds is practically eliminated.

★ **It improves surface quality and reduces scrap**
This silicone mold lubricant gives quick release; does not decompose and therefore gives sharp patterns and clean molded surfaces.

★ **It is inexpensive and easy to apply**
Used in concentrations ranging from 50 to 150 parts of water to 1 part of the Emulsion, one application is frequently sufficient for several moldings. Easily applied by brushing or spraying.

For further information request leaflet U54 from

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Resin & Rubber Compounds
"made to order" for Your Requirements

Do manufacturing problems in the production of dipped goods, combined and coated fabrics have you constantly perplexed? Synthetic Adhesives' technicians have a vast store of experience in natural and synthetic rubber formulations that is yours for the asking. So if you're now producing or plan to produce any of the following, call on our experts for the correct answer to your problems.

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Distributor of
GR-S Synthetic Latices
By Appointment of Office of Rubber Reserve

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Ernest Jacoby & Co., 79 Milk St., Boston, Mass.
Reinke & Amende, Inc., 1925 East Olympic Blvd., Los Angeles, Cal.
Charles T. Wilson Company (Canada) Ltd., 406 Royal Bank Building, Toronto, Canada

Dunlop has leased a cotton mill at Hindley Green near Wigan, which will prepare cotton yarn so that it can be converted into tire cord at the company's mill at Rochdale. The new mill, which is to employ 300 persons, is to operate on a small scale at first, but it is expected to be in full production by next summer.

New Companies Formed

Rubber Improvement, Ltd., recently was reorganized, and a new company, bearing the same name has been formed with an authorized share capital of £250,000, of which all the ordinary shares, amounting to £150,000, have been issued. The objects of the concern are to manufacture, refine and reclaim, and deal in rubber, plastics, and other allied commodities, and to undertake the production of raw rubber. The company has set up large new departments for treating and manufacturing plastics, chiefly polyvinyl chloride and its polymers, and the production of polystyrene molding crystals.

Draftex Ltd., newly registered, will manufacture draught excluding and sealing materials and appliances, metal, rubber and plastic moldings and extrusions and fabrics. The company has a capital of £25,000. Directors include T. J. R. Bright, T. Fletcher, and R. K. Calder.

Universal Injection Plastics, Ltd., with capital of £10,000, has been organized to manufacture (by injection process only) bakelite and other materials into plastic and molded articles and goods of all kinds. Directors are J. Johnston, A. E. Herdman, G. Fraser, and L. F. Pittet, the first three being also directors of Universal Plastics, Ltd.

The Star Rubber Production Co., Ltd., has been formed with a capital of £10,000 to acquire the business of Star Rubber Production Co., carried on at Bournemouth and elsewhere. Permanent directors are W. Allin, director of Rubber Engineering Co., and J. W. Allen, director of W. A. M. Tire Co., Ltd.

Dahan Rubber Estates, Ltd., has been formed with a capital of £75,000 to acquire the undertaking and all or part of the property and assets of the Dahan Rubber Estates (1933) Ltd., (incorporated January 12, 1933) and to acquire estates in Borneo and elsewhere.

Other Rubber Industry Notes

Among the token imports of goods from Belgium now allowed are rubber footwear, including men's and women's short boots, and men's stormkings, all cleated, and women's and misses' short boots, varnished; rubber heels and soles; surgeon's rubber gloves; fountain pens and parts; plastic buttons; and rubber belting except conveyer belting. Imports may represent up to 20% of Belgian manufacturers' prewar trade with the United Kingdom in the goods listed.

Technicians of the Goodyear Tire & Rubber Co. (Great Britain), Ltd., have just completed the job of electrically splicing a complete coal conveyer belt installation to make it endless. It seems that two Goodyear belts fitted to Sutcliffe conveyers, installed at the Nottingham & Clifton Colliery, operated by the Ministry of Fuel and Power, were causing difficulties in operation. The two 30-inch six-ply conveyer belts of 345-yard centers had been in use eight months carrying 1,000 tons per shift at a speed of 350 feet per minute against a grade of 1 in 6 on a trunk installation 690 yards long. The speed and strain made constant inspection of the joints necessary, and joints had to be remade to avoid production delays. The colliery management applied to Goodyear, and experts of this company, working with the makers of the conveyers, decided that the solution of the trouble would be to vulcanize the joints so as to create an endless belt. Several advantages are said to have been gained by this procedure: the belt has been considerably strengthened so that it can carry its maximum load without reduction of the safety factor, and the nuisance and dangers created by dust and stuck hinges have been eliminated.

The lacquer and plastic production of the East Anglia Chemical Co. has developed to such an extent that the company found it necessary to move from its premises in Nuneaton to a new and more spacious factory in Darlington.

The British Rubber Publicity Association, Fenchurch St., London, E.C.3, has changed its name to British Rubber Development Board.

In order to be in a position to come to an agreement with the United States Rubber Co., the North British Rubber Co., called an extraordinary meeting for September 23 to approve

an increase in the capital to £1,350,000 by the creation of 350,000 new ordinary shares of £1 each. At an earlier meeting it had been revealed that at first the British Treasury had objected to an arrangement made last year, but the Treasury apparently has now withdrawn its objections.

H. F. Schofield, director of Witco Chemical Co., Ltd., recently left England to visit America with the main object of studying the latest developments in manufacture and research at the carbon black plants of Witco and Continental Carbon Co.'s organization in America.

FRANCE

Aqueous Dye Baths for Polyvinyl Chloride

The use of organic dyes, when incorporated in polyvinyl chloride in the mass, is complicated by the fact that the manufacturing temperatures, compounding ingredients, and technical conditions under which the finished articles are utilized affect the fastness of the colors.

R. Thiollet[1] suggests the alternative process of dyeing polyvinyl chloride in colors dispersed or dissolved in aqueous medium, for special uses. As suitable water-soluble colors he mentions certain azo and triphenylmethane dyes, so-called "basic dyes," which impart very pronounced shades to polyvinyl chloride, including: Chrysoidine J, Phenylene Brown S, Fuchsine A, Rhodamine 6J, Rhodamine B, Crystal Violet, Paris Violet 2B, Victoria Blue B, Meidola Blue M, Malachite Green J S ES, and bright green. For a liter of dye he recommends one gram of basic color mixed with one gram of acetic acid, to which boiling water is added to make up the required amount, and five grams of saponine. The acetic acid facilitates the dissolution of the dyes, and the saponine is a wetting agent which does not precipitate basic dyes and is indispensable for obtaining an even color. In such a bath, maintained at 90 to 100° C., dyeing is affected in 30 seconds.

Acetoquinone dyes are insoluble in water, but are readily dispersible in it, and the following are suitable for plasticized polyvinyl chloride:

Acetoquinone Yellow	4 J	Acetoquinone Ruby	B
Acetoquinone Yellow	3 J	Acetoquinone Bright Red	N pure
Acetoquinone Yellow	2 J	Acetoquinone Heliotrope	N pure
Acetoquinone Orange	JR pure	Acetoquinone Violet	N
Acetoquinone Orange	N	Acetoquinone Blue	FJ
Acetoquinone Red	IS	Acetoquinone Blue	J
Acetoquinone Scarlet	R	Acetoquinone Blue	F
		Acetoquinone Black	B

Here again dyeing is effected in 30 seconds at 90-100° C. in a bath containing per liter four grams of acetoquinone dye, 10 grams of Dispergine CB solution (a sulfonated formonaphthalenic compound) and five grams Coptal N paste (an alkylnaphthalene sulfonate of sodium). The dye is mixed with the Dispergine CB solution and the Coptal N paste; then the required amount of boiling water is added.

The water-soluble dyes are not fast to light, but they resist the action of mineral oils and benzol. The water-dispersible dyes have good resistance to sunlight and to mineral oils, but not to benzol. When used in aqueous media, both types of dyes have a tendency to migrate from the surface of a tinted article to the interior a process which is very slow at ordinary temperatures, but very rapid in the presence of heat.

[1] *Rev. gén. Caoutchouc*, 23, 8, 205-206, 1946.

Training Schools for the Rubber Industry

As far as is known, only two educational institutions in France specialize in the training of engineers and technologists for the rubber industry—the Institut Français du Caoutchouc and the University of Clermont-Ferrand. The type of training required by the French rubber industry in personnel in the lower brackets and in laboratory assistants has hitherto only been given by certain individual companies.

Both the rubber and the chemicals industries are attempting to remedy the situation. The rubber industry has established the Centre Technique d'Enseignement Ouvrier, known as the C.T.E.O. (Technical Center of Personnel Instruction);

Nipple (A) is connected to roll or drum. Collar (B) is keyed to it (C), but fits looosely so pressure can fill entire housing to act as sealing force. Both seal ring (D) and bearing ring (E) are of carbon-graphite, eliminate packing and oiling. Spring (F) is for initial seating only. Type B Joint shown; other types, sizes for all needs.

In terms of physical size alone, the Johnson Joint could hardly be called big machinery. But in its ability to save time and trouble, and promote plant efficiency, its stature approaches anything the industry has ever seen.

The Johnson Joint was designed to go after the old stuffing box and steam fit troubles in a business-like way, and it literally knocks the stuffing out of them. There's no packing of any kind. There's no oiling required, ever. There's no adjusting — the higher the pressure, the tighter the seal. There's little to fear from misalignment — with provision for both lateral and angular movement built right in. Note besides how neatly it provides for more efficient syphon drainage, through the same head that admits the steam.

In dollars and cents, what does all this add up to? Well . . . enough at least to pay the cost of switching over to Johnson Joints in just a short while. Enough certainly to make the Johnson Joint too big to overlook.

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while the Association of Chemical Industries has formed an Ecole D'Apprentissage (Apprentices' School), both in Paris.

The C.T.E.O. offers an elementary and an advanced course, each covering two years and each giving one year of general instruction followed by a year devoted specifically to rubber. No entrance examination is required for the first year of the elementary course, but to qualify for the second year and for the advanced course, students must give proof of adequate proficiency. The advanced course devoted to rubber will not be given until 1947. All instruction is free, and where circumstances indicate the need of it, special allowances will be made to the families of students to make up for the wages otherwise obtained as plain laborers.

The Apprentices' School of the chemical industry offers a course of three years—two years at school followed by a year partly spent in school and partly in a factory; in the latter case following an apprenticeship contract to be signed by the apprentice and his employer. Here too instruction is free to the pupil, the costs are borne by the Association in the first two years and in the third, by the companies who have signed apprenticeship contracts. The Chemical Apprenticeship is more or less of an experiment; if it succeeds, it will be extended; otherwise it will be abandoned.

Training for the rubber industry along the lines indicated above is also planned for the provinces. But rubber manufacturers in the Rouen and Lyons districts have already taken the initiative and have taken steps to start apprentices' schools.

New Developments

A recently published French patent (903,859) gives details for reclaiming Buna rubbers with the aid of schist oils. First the oils are heated for 4-5 hours under pressure of 4-6 atmospheres with an alkaline solution of keratine in the presence of zinc oxide as a catalyst. The viscous mass obtained is mixed with the rubber to be reclaimed, and the whole heated 2-3 hours at 125°C. The process may also be used for natural rubber waste from rubber-like materials other than Buna. It is claimed that reclaiming by the described process is facilitated by operating in the presence of 1-4% of natural rubber.

A new type of tennis ball has been invented by a manufacturer of Paris, M. Barville. The new balls are made of cellular rubber, the cells of which gradually decrease in size from the center out so that at the periphery the material has a microporous structure. It is emphasized that only natural rubber and no synthetic material whatever can be used in the production of these balls, which apparently are indistinguishable from the usual type of tennis balls as far as weight, diameter, rebound, and hardness are concerned. The balls also have the usual felt cover, which can be replaced when worn. The balls are not yet manufactured on any extensive scale, but it is expected that when adequate supplies of natural rubber are again available, output will increase considerably.

The recently published report for 1945 of French Dunlop reveals that after 1,100,000 francs provided for reequipment, and losses amounting to 61,000,000 francs were written off, accounts for the year showed neither profit nor loss. The company is at present operating at 70% of the pre-war level but hopes to achieve 100% by the end of this year.

RUSSIA

In line with Russian plans for greatly increased outputs in various fields of industrial activity during the Fourth Five-Year Plan, special ministries are said to have been created to control the various branches including coal, petroleum, chemistry, automobiles, machines and tools, electricity, rubber. The minister for rubber is understood to be M. Mitrochine.

It seems that the new plan calls for doubled output in the rubber industry. New tire factories are to be built by 1950 in the Ukraine, Western Siberia, and other parts of the country, and they are to be equipped to permit twice the prevailing output per worker. Research on synthetic rubber is to be expanded; and experimental and pilot plants are to be set up. More interest is to be shown in producing synthetic rub-

ber from materials other than foodstuffs, and an increase of 38% is aimed at for this type of rubber.

Plans regarding *kok-saghyz* are ambitious. Russian scientists hope to be able to develop large-scale production of this rubber to the point where the yield per acre per annum will equal that from tropical rubber trees. The cost of exploiting *kok-saghyz* will be reduced by making use of the tops of the plant for cattle-feed and by producing alcohol as a by-product.

In a Russian publication[1] is described an adhesive for fabrics, leather, and rubber which contains the Russian synthetic rubber, Sovprene, butyl acetate or dichlorethane, zinc oxide and oxide of magnesium, sulfur and benzene. This adhesive is said to be especially suitable for joints because of its resistance to oils.

[1] *Legkaya Prom.*, 4, 12, 18 (1944).

TURKEY

Before the war Turkey's average annual consumption of rubber was about 350 tons, but present needs are put at 600 tons. There are now seven rubber factories in the country in addition to 15-20 small rubber workshops which together are able to supply a considerable proportion of the limited local requirements.

Recent reports in the foreign press state that Turkey is preparing to manufacture synthetic rubber. It seems that equipment is due from the United States and the United Kingdom.

EUROPEAN NOTES

The lack of raw materials forced the tire factory in Nokia, Finland, to close down in March, 1944. But now that rubber and other needed materials are again coming into the country, manufacture of tires is to be resumed shortly.

According to a Reuter dispatch a new company has been formed with an initial capital of 150,000 kronor to manufacture plastic articles by an American process. A factory is to be built at Flenmo, Melloesa, Sweden and the first products are to be combs.

Following negotiations reportedly held in Moscow, representatives of Czechoslovakia's nationalized cable industry have received orders for cables with a total value of about $4,000,000. Russia is to supply necessary raw materials including copper, lead, jute, and rubber.

FOR FURTHER DETAILS, SEE AD ON PAGE 160

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FAR EAST

CEYLON

Performance of Special Clones

The combined third and fourth quarterly circulars for 1945 issued by the Rubber Research Scheme (Ceylon) contains a report of the results of a questionnaire sent to a number of Ceylon estates on the performances of clones and and seedling families tapped on a commercial scale in 1944. Responses were received from 71 estates involving 5,674 acres of budgrafts and clonal seedlings. In general records are from fields tapped at 100% intensity, and comparison is made between clones growing on the same estate.

The older clones included Tj. 1, Tj. 16, DB 5, BD 10, Av 49, and AV 50. In most cases Tj. 1 maintained its reputation as highest yielder of the most widely planted clones. However several bad outbreaks of Brown Bast were recorded among trees of this clone, especially on one estate where tapping had been intensified to increase crop. It has usually been held that this clone is not suitable for planting in areas of low rainfall, but the questionnaire revealed that on one estate in a dry district yields from Tj. 1 were far above those of BD 5 on the same estate.

Tj. 16 gave variable yields which on the whole were lower than those of Tj. 1. But on some estates even Tj. 1 proved disappointing, giving only 358 pounds per acre at ten years of age, and in another, 394 pounds at 11 years of age. No doubt local conditions were unfavorable and had a retarding effect on the yield capacity of the clone.

BD 5 appears on several estates for it is a good yielder, but the clone is no longer recommended because of poor secondary characters. AV 49 and AV 50, reliable, but comparatively moderate yielders, proved capable of yielding a maximum of 800-900 pounds per acre, but there were no records of yields of 1,000 pounds or more as in the case of the other clones just mentioned.

The newer, Malayan clones included Gl. 1, PB 86, HC 28, and HC 55. The last named clone is no longer recommended. Of the others, Glenshiel 1, though capable of higher yields than those recorded for Tj. 1, is decidedly less vigorous than the latter and will not withstand tapping at 100% intensity for more than one year. Prang Besar 86 seems to give less than Gl. 1 in the first year, but compares favorably with Tj. 1, and it is thought likely that its good performance in Malaya will be repeated in Ceylon.

The report under consideration also included the first record of yields from commercial areas in Ceylon planted with seedlings from the Prang Besar Isolated Seed Gardens. The yields for the first year are considered very satisfactory and, if age is taken into account, are in all cases higher than those of the budded trees.

New Government Rubber Technologist

The newly appointed government rubber technologist, A. Sundaralingam, arrived here recently from England, where he had been engaged in rubber research work for the British Rubber Producers' Research Association. There has not been time enough to establish a properly equipped laboratory; so in the meantime Dr. Sundaralingam is working at the Rubber Research Scheme at Agalawatte. He will have an office in Colombo, where he will be available at least once a week to rubber manufacturers seeking his advice and services. He has submitted a scheme to the Minister of Labor, Industry and Commerce for the organization of his department and the training of the necessary technical personnel.

One of the first questions put to Dr. Sundaralingam by local reporters was his opinion of synthetic rubber, and he replied that he sincerely felt that it was inferior to natural rubber for tires. As to rubber prices, he stated that he certainly did not think that Ceylon could supply natural rubber at prewar prices, because of increased costs, especially of labor, which he pointed out constitute 90% of the total cost of producing rubber. But he did not think that synthetic rubber would touch the natural product for at least the next five years because of the enormous demand for the latter.

Ceylon Estates Staffs Merge with Union

The Estates Staffs' Association of Ceylon has decided to merge all its interests in the Ceylon Estate Staffs' Union formed not long ago. The former body was founded 26 years ago, but since its scope was limited, it had been resolved to organize a union which would be able to promote and protect the welfare of members more forcefully and more effectively.

NETHERLANDS INDIA

The Central Bureau of Statistics at Batavia not long ago published data showing that exports of rubber from the Netherlands India during the period November, 1945, to May, 1946, totaled 9,097 tons. According to the "Rubber Statistical Bulletin," the monthly publication of the London Rubber Secretariat, the July, 1946, exports of rubber from Netherlands India were estimated at 20,000 tons, giving an annual rate of 240,000 tons. In June, 1946, the same source shows exports at the rate of 180,000 tons a year, or 15,000 tons for that month. On the basis of these figures one would judge that there had been a sudden, remarkable spurt in exports from Netherlands India in the two summer months. But the possibility must be considered that the smaller Dutch figure represents rubber which left the Dutch territories in the regular way and on which duties were duly paid; while the larger British figure includes smuggled rubber, of which the Dutch authorities naturally would have no record. In that case, the latter figure would offer a measure of the extent of smuggling from the Dutch islands.

That this surmise is probably correct is suggested by the fact that the Netherlands Indian Government has decided to control rubber shipments and has given notice that in future permits will be required for the export of rubber and other products from the Dutch territories to Singapore. The Dutch explain that this measure has been undertaken not only to prevent evasion of export dues, but also to prevent exports detrimental to the general welfare of the country. They further claim that much looted machinery from estates in Java and Sumatra has been shipped to Malaya, and the new control seeks to put a stop to this practice also.

Meanwhile steps are being taken to encourage legitimate exports of rubber. It is learned that the Netherlands India Rubber Fund has sent representatives to Borneo and Banka to set up sorting and packing centers in the islands and to provide trucks, tugboats, and lighters to facilitate transportation. Production here seems to be progressing. In Java production on part of the government owned estates in the Batavia district has commenced. The estates total 6,250 acres, but at present only 500 acres are being tapped, giving a daily yield of 900 to 1,100 pounds, it is reported. Another 2,500 acres are expected to come into production by the end of this year. Adequate labor is available.

AUSTRALIA

From Melbourne, comes news of a new, locally produced tennis ball that will not get wet. Special profing permits a ball to be used immediately after contact with water without fear of injury to racket strings, and the proofing also does not affect adversely either the wearing or playing qualities of the ball.

The end of tire rationing in Australia on September 2 let loose an immediate and unprecedented clamor for tires by dealers and private parties alike. Apparently consumers showed no disposition to wait until production of natural rubber tires, scheduled to start again in October on receipt of the first postwar shipments of rubber from Malaya, got under way.

Local manufacturers of bicycle tires are undoubtedly also being swamped with demands for tires to equip the very large number of bicycles that have been ordered by various foreign

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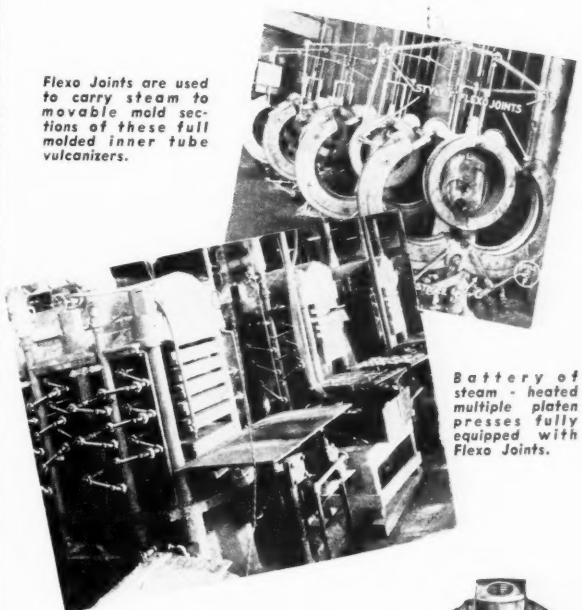
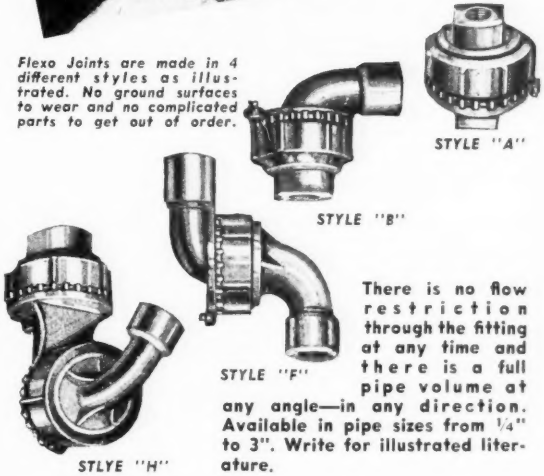


Battery of steam - heated multiple platen presses fully equipped with Flexo Joints.

Flexo Joints are made in 4 different styles as illustrated. No ground surfaces to wear and no complicated parts to get out of order.



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countries. It is reported that orders for 1,000,000 bicycles were received from Greece, South Africa, and various countries in Asia in a period of six months. The latest order was for 600,000 bicycles for China and Manchuria.

MALAYA

It is announced that a merger has been proposed to the Ayer Kuning (F.M.S.) Rubber Co. by the Highlands & Lowlands Para Rubber Co., which at the same time offered to buy the Subang Estate of the Krian Rubber Plantations Co. All these estates are in Malaya and together have a potential rubber output of 5,173,900 pounds a year.

LATIN AMERICA

BRAZIL

The United States, which controls all surplus rubber produced in Brazil, has released for shipment to Argentina enough rubber to permit Brazil to obtain almost 150,000 tons of wheat in exchange. Argentina is to get 578 tons of rubber immediately and a further 1,280 tons at a later date.

In 1945 rubber accounted for 2.8% of Brazil's total exports and ranked fifth in order of importance on the republic's list of goods and materials sold abroad. The exports of Brazilian rubber in that year came to 18,887 tons, valued at 345,924,000 cruzeiros. The 1945 exports also included 9,432 tons of carnauba wax, valued at 270,437,000 cruzeiros.

During the first quarter of 1946, Brazil's exports included 5,441 metric tons of crude rubber and latex, 31 tons of chicle gum, 248 tons of coquirana, Manicoba, and Mangabeira, and 795 tons of guttas, balata, and the like. Except for 14 tons of gutta, all the rubber exported went to the United States. During the same period 463 metric tons of tires, 47 tons of tubes, and 260 tons of other rubber goods were exported by Brazil, only 37 tons of other rubber goods going to the United States.

De La Rue Plastics, Ltd., of England, is understood to have joined Brazilian interests in the financing of a new plastics factory to be established in Sao Paulo. The initial capital is said to amount to $300,000.

LATIN AMERICAN NOTES

During the war the Government of Ecuador imported and distributed motor vehicles, tires, and tubes to dealers for sale. The import regulations have now been relaxed to permit direct distribution of these goods by importers. However, as in wartime, selling prices will continue to be set by the Office of Foreign Commerce in the Ministry of Economy, which will also fix the percentage importers must sell to public bodies.

A striking increase in the 1945 output of tires and tubes, for passenger cars in particular, is reported from Uruguay. Whereas production of passenger-car tires was only 1,489 in 1944, the figure soared to 14,015 in 1945; passenger-car tubes rose from 320 to 3,317; truck and bus tires, from 10,376 to 13,156; and truck and bus tubes from 4,425 to 6,350.

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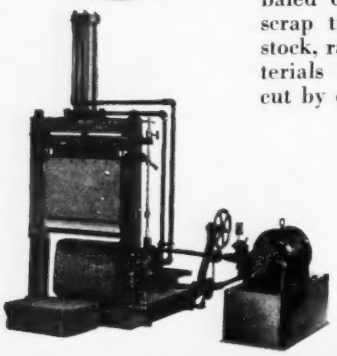

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Editor's Book Table

BOOK REVIEWS

"The Industrial Republic—Reflections of an Industrial Lieutenant." P. W. Litchfield. Corday & Gross Co., Cleveland, O. Cloth, 6 by 9¼ inches, 208 pages. Price $4.

This new book by Mr. Litchfield, chairman of the board of the Goodyear Tire & Rubber Co., Akron, O., presents the views he has gained through a half century of industrial experience.

"The Industrial Republic," the first of the book's four sections, is a reprint of a book on the same subject written by Mr. Litchfield in 1919, at the conclusion of the first world war. This book contained an examination of our industrial economy and suggested remedies for some of the ills then existing. It is included herein because it traces the expansion of our political democracy and the parallel development of the labor-capital struggle through the first war era, and because many of the remedies then suggested apply equally well now. The second section, "Industry under the Industrial Assembly," describes the Goodyear employe representation plan which operated from 1919 to 1936 and grew out of the principles expounded in "The Industrial Republic." The assembly passed out of existence under a Supreme Court ruling which classed it as a "company union," but its strengths and weaknesses are analyzed in the light of experience.

"Industry under National Unions," the third section, reviews the impact of modern unionism on the Goodyear company, discussing the methods and results of the period beginning with the major company strike in 1936 and extending up to the present day. Included in this section is a discussion of the company's labor problems during World War II, operating under the "Little Steel" formula and the War Labor Board.

The fourth and concluding section of this volume is entitled "A Democratic Solution", and this solution, according to Mr. Litchfield, "is based on the concept that we should mold our industrial structure in principle, in law, and in spirit as closely as possible to the form of our national constitutional government . . ." In developing this solution labor, capital, management, the methods of communistic and fascistic dictatorships, productivity, unionism, wages and related subjects, and the place of our government in industrial relations are discussed at length.

Of particular interest in the last chapter under "Conclusions" is the summary of the policies that labor, management, and the public should follow if a real industrial republic is to be set up in America.

"We may all look forward to a more peaceful and more abundant life if workers, manager, capitalists and the public generally will join in an active interest to see that just practices are put into effect in industry," Mr. Litchfield states finally.

"1940-41 Bibliography of Rubber Literature (Including Patents)." Published by the Division of Rubber Chemistry of the American Chemical Society. Sold by *The Rubber Age*, 250 W. 57th St., New York 19, N. Y. Cloth, 6 by 9 inches, 296 pages. Price $5.

This bibliography, the fifth in this series on rubber literature and the first edition under the sponsorship of the Division of Rubber Chemistry, was compiled, edited, and prepared by the Division's bibliography committee, consisting of C. C. Davis, M. E. Lerner, C. W. Christensen, and John McGavack, chairman. The previous editions excluded patents and were compiled by D. E. Cable and published by *The Rubber Age*.

The current edition continues the letter-number combination method of identifying references which expedites the use of cross-references and indices. For the first time patent references are included, and brief, one-sentence abstracts are also given with each reference. The new volume shows a consequent increase in the number of pages devoted to references, with 172 as compared with 116 pages in the 1938-39 edition. Some changes have also been made in the classification groups, some being merged and other being subdivided, to agree with further developments in rubber technology. As in previous editions, comprehensive author and subject indices appear.

No critical review of this bibliography is necessary; the reception accorded to previous editions has amply demonstrated the value of these volumes in directing literature searches on published work in the rubber field.

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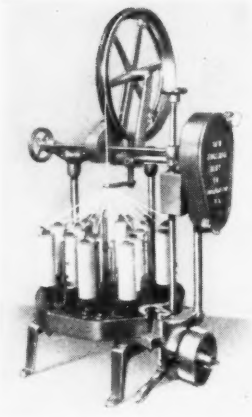

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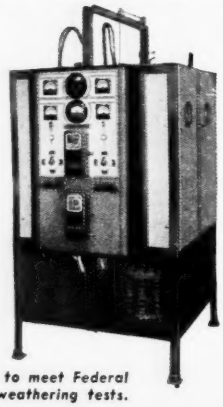

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"Steam Trapping and Air Venting." L. G. Northcroft. Chemical Publishing Co., 26 Court St., Brooklyn 2, N. Y. Cloth, 5⅛ by 8¾ inches, 172 pages. Price $4.50.

This book, a reprint of a 1944 English publication, fulfills the need for a complete reference work on steam trapping and air venting methods, especially as a means for full economy and increased production. Stress is laid on the importance of correct and up-to-date methods of condensate drainage and adequate air venting arrangements. Methods for obtaining steam economy and efficiency are discussed in detail, profusely illustrated with diagrams, graphs, and tables.

Of special interest are the sections on the use of steam in open vulcanizers, vulcanizing presses and multi-platen presses used in the rubber industry. Diagrams of proper installations are given, together with discussions of considerations involved. Besides individual sections are devoted to similar discussions on the use of steam in reaction vessels, stills, digesters, and other process equipment employing this method of heating.

Although emphasis is placed on practical uses and considerations, sufficient discussion is given on theoretical aspects and the underlying principles involved. Written in a clear and simple style the book should be a value to every steam user. In addition to an index there are appendices on sizing steam pipes, sizing of condensate return pipes, condensation rates, and steam tables.

NEW PUBLICATIONS

"Witcarb R—Rubber Reinforcing Pigment." Bulletin 46-2. August, 1946. Witco Chemical Co., 295 Madison Ave., New York 17, N. Y. 44 pages. This booklet contains information from previous bulletins, 44-2 and 45-2, together with additional information developed in the company's technical service laboratory. Appearing also is a section discussing the reinforcement of elastomers, another on the physical properties of the Witcarbs, and extensive sections giving test data and graphs on the effect on properties of vulcanizates of natural, reclaimed, and synthetic rubbers obtained by use of various loadings of Witcarb R and by various pigments. A summary of the information presented and a bibliography are also included.

"New Fisk Industrial Solid Tires." United States Rubber Co., 1230 Sixth Ave., New York, N. Y. 4 pages. This illustrated bulletin describes the advantages offered by the solid tire, illustrates the tread designs available, and lists industries using the tires.

Publications of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. **"ELA, A New Elastomer Lubricating Agent."** BL-210, August 19, 1946. 2 pages. This bulletin on ELA, a processing aid, deals with its methods of use, amounts to use, physical characteristics, precautions in using, advantages, and effect on curing rate. **"Neoprene Industrial Solid Tires."** BL-213, July 5, 1946. 2 pages. This is, in effect, a supplement to BL-175, showing how to obtain higher durometer hardness solid tire compounds with HMF black. **"The Preparation of Dispersions and Emulsions with Glue as the Protective Colloid"** BL-214, July 26, 1946. 4 pages. This sheet gives formulations and data indicating that glue can be used as a protective colloid to produce the required stability of emulsions and dispersions, with powdered bone glue being preferred. **"Copper Inhibitor X-872-L."** BL-216, July 31, 1946. 2 pages. The chemical composition, properties, uses, and compounding characteristics of this product are given, together with ratios to use in replacing Copper Inhibitor X-872. **"Neoprene Latices Types 842 and 601."** BL-217, August 16, 1946. 4 pages. This bulletin discusses the two new neoprene latex types, giving their properties, compounding techniques with typical formulations and test data, and their use in sponge products with standard formulas included. **"Compounding of Neoprene for High Recovery after Compression at Low Temperatures."** BL-218, August 30, 1946. 2 pages. Information and test data appear on the use of sulfur vulcanization of GR-M to obtain high recovery after compression at low temperatures.

"**Ty-Ply, a Non-Tacky Adhesive for Bonding Natural and Synthetic Rubbers to Metal.**" Booklet No. 16B. R. T. Vanderbilt Co., 230 Park Ave., New York 17, N. Y. September 15, 1946. 16 pages. This booklet, after a general discussion of Ty-Ply, its action and methods of use, and a review of the A.S.T.M. procedure for measuring adhesion, gives individual data on uses of Ty-Plys Q, S, and SC. Information on handling and application is covered, together with test data on adhesive properties obtained. There is also a handy table on the qualities of the adhesive bonds obtained with various types of rubbers to 19 metals, by means of the Ty-Plys.

"**Green Book 1946-47 Buyer Directory.**" Schnell Publishing Co., Inc., 59 John St., New York 7, N. Y. 1296 pages. In keeping with the increase in number and variety of industrial chemicals being produced, this thirty-fourth annual edition lists the sources of supply of a greater number of chemicals, oils, drugs, and related materials than has appeared in any previous issue. The book is divided into four sections: chemicals and related materials; equipment and operating supplies; technical and commercial services; and addresses of suppliers. Manufacturers and suppliers of chemicals for latex and rubber compounding are included.

"**Barrett Rubber Compounding Materials.**" Rubber Laboratory Release No. 4. Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. 16 pages. This bulletin covers BRS 700, a new softener and extender recently added to the company's line. The product is especially recommended for use in GR-S. For a typical GR-S formulation, test data, including charts and graphs, are given to show the effect of increasing amounts of BRS 700 on tensile properties, tear resistance, abrasion resistance, crack-growth resistance, compression set, resilience, and hysteresis properties both before and after air-oven aging.

"**Cabot Carbon Blacks for Rubber.**" Fred H. Amon. Godfrey L. Cabot, Inc., 77 Franklin St., Boston 10, Mass. 4 pages plus enclosure. This technical bulletin is the first of a new series to be published by Cabot. Types, grades, properties, and uses of the company's blacks are discussed, with detailed information on compounding of the different synthetic rubbers and the use of the blacks in specific formulations, as for tires, footwear, heels and soles, wire insulation, and others. Also enclosed is a chart classifying blacks by groups, brand names, manufacturers, and uses.

"**Indulin for Reinforcing Rubber.**" Bulletin L-4. West Virginia Pulp & Paper Co., 230 Park Ave., New York 17, N. Y. 32 pages. This bulletin describes the properties and function in rubber compounding of Indulin, a new lignin derivative. Discussions, test data, and formulations are given on the use of the material as a reinforcer for GR-S, natural, and other rubbers by the coprecipitation process. In adding to its reinforcing properties, the material is shown to reduce breakdown time and speed up processing. Alkaline aqueous solutions of Indulin act as dispersing mediums for blacks and other pigments prior to being added to the latex, which is then coprecipitated.

"**The Record of Rayon Cord in Tires.**" American Viscose Corp., New York, N. Y. 24 pages. The booklet, illustrated by means of photographs, drawings, and test-data diagrams, summarizes the facts on the use of rayon cord in tires. After a discussion of the functions of the cord and the tire, data are presented on the tested characteristics of both rayon and natural cords and their effect on tire performance. A series of photographs on the making of rayon cord tires is included, together with a sample of 1100 denier two-ply rayon cord as used in tires.

"**New, Water Repellent Fire Hose.**" American-LaFrance-Foamite Corp., Elmira, N. Y. 12 pages. This publication describes a new all-weather line of white, water repellent, mildew resistant fire hose made for the company by Goodyear. Descriptions and illustrations are presented of the five grades available, together with constructional features.

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"Valvair Air Control Valves." Valvair Corp., Akron, O. 4 pages. This folder illustrates the company's line of air valves and gives some description of their function design principles and sizes.

"Technical Data Sheet." Adhesive Products Corp., 1660 Boone Ave., Bronx 60, N. Y. 1 page. This data sheet on the company's 1971 Emulsion, 1917 AP Foam Reducer, and 1909 Emulsion covers their chemical composition, properties, purpose, latices in which they may be compounded, methods of use, function, applications and comments.

"Eliminating Guesswork." United Laboratories, Inc., 10801 Euclid Ave., Cleveland 12, O. 4 pages. This booklet offers an introduction to the company's maintenance services. The organization tests and certifies maintenance materials, including surfacing materials, paints, roofing products and, insulations. These materials are then supplied to customers together with supervision of their use. A handy reference chart for maintenance superintendents and engineers of the company's services is included, together with a representative list of customers.

"Ride and Vibration Data." Society of Automotive Engineers, Inc., 29 W. 39th St., New York 18, N. Y. 20 pages. Price $0.50 to SAE members; $1 to non-members. By means of eight charts, this booklet presents basic data pertaining to suspension problems and vibrating systems in convenient reference form. The charts show relations between the variables involved and are accompanied by explanatory notes on equations, definitions, and illustrative examples.

Publications of Hercules Powder Co., Wilmington, Del. **"Age Resistance of GR-S-10 Versus GR-S."** Technical Bulletin No. 8. 2 pages. Data are listed on resistance to aging of GR-S-10 and GR-S stocks containing 30-volume loadings of precipitated calcium carbonate. Data presented cover unsoftened stocks and stocks containing Staybelite Resin or Cumar MH 2½ resin as softeners. **"Age Resistance of GR-S-10 Versus GR-S."** Technical Bulletin No. 9. 2 pages. This bulletin is similar to No. 8 except that 45-volume loadings of zinc oxide are used in place of the precipitated calcium carbonate.

"Control of Industrial Heat and Power Losses." Industrial Mineral Wool Institute, New York 17, N. Y. 20 pages. This manual for process engineers and power men offers practical engineering methods of calculating and reducing preventable heat and fuel losses by proper insulation, illustrated by nine case histories. Descriptions of the various forms of mineral wool are also included.

"Pervoi." Pervoi Engineering, Ltd., Dunstable, Beds., England. 32 pages. This illustrated brochure describes the activities of the company in designing and supplying rubber molding and plant equipment, including molds, trimmers, and special equipment. Besides an explanation of policy there are sections on standard practice, standard units, component design, and shrinkage tables.

Publications of Hewitt Rubber Division of Hewitt-Robins, Inc., Buffalo 5, N. Y. **"Rest Assured with Hewitt Restfoam."** 12 pages. This booklet describes and illustrates the advantages of the company's Restfoam foamed latex cushioning material for all applications. **"Best Bet in Riding Comfort**—Hewitt Restfoam." 4 pages. This folder describes in detail the advantages of Restfoam cushioning for public carriers.

"U. S. Surplus Property: How, What, Where." War Assets Administration, Washington 25, D. C. 32 pages. This illustrated booklet is a handy guide for prospective purchasers of surplus property of all kinds. Explanations are given on priorities and on where to get detailed information on sales also listed are sales offices of WAA and certification offices.

"The Action of Embeco in Concrete and Mortars." Second Edition. Master Builders Co., Cleveland, O. 36 pages. This booklet on Embeco, a specially prepared metallic aggregate, explains its action in controlling shrinkage of mortar and concrete and describes its use in machinery and heavy equipment grouting, patching and repairing concrete, and other applications. Technical data are given in the form of charts and graphs.

"How to Use Carbon Tetrachloride Safely: Tips to the Foreman." Safety Research Institute, 420 Lexington Ave., New York 17, N. Y. 4 pages. Price 5¢. This folder gives information on the proper handling and storage of carbon tetrachloride and directions for first aid in case of accident.

"1946 Classified Directory." Tenth Edition. Association of Consulting Chemists & Chemical Engineers, Inc., 50 E. 41st St., New York 17, N. Y. 116 pages. This directory lists the member organizations, their location, personnel and scope of activity. A key sheet lists specializing and qualified consultants according to fields. Also included are alphabetical and geographical indices.

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FOR EASY PROCESSING USE PHILBLACK A

FOR FURTHER DETAILS, SEE AD ON PAGE 160

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Market Reviews

COTTON & FABRICS

NEW YORK COTTON EXCHANGE
WEEK-END CLOSING PRICES

	Aug. 30	Sept. 28	Oct. 5	Oct. 12	Oct. 19	Oct. 26
Futures						
Nov. .. 1947	36.25	37.97	38.59	38.65	33.32	33.31
Jan. ..	36.15	37.72	38.34	38.22	33.18	33.02
Apr. ..	35.86	37.35	37.94	37.83	32.75	32.66
June ..	35.38	36.56	37.36	37.16	32.05	31.88
Aug. ..	34.35	35.06	35.86	35.43	30.68	30.28
Oct. ..	32.90	33.10	33.57	32.89	28.85	28.05

THE most significant commodity development in some time occurred in the cotton market during October. Prices were depressed almost $50 a bale during the month. However the government promised aid in attempting to stabilize prices. An invitation to the farmer to put cotton under loans at the standing government offer of 92½% of parity during this selling session was issued by the Department of Agriculture.

The 15/16-inch middling spot price on October 1 was 39.10¢ a pound; it rose to a 26-year high of 39.78¢ a pound on the following day. Prices then fluctuated until October 15 when 39.19¢ a pound was registered. The break occurred on October 16, and prices fell to 37.19¢ a pound, dropped again on the 17th, to 35.28¢ a pound, and again on the 18th to 34.20¢. Trading was suspended on October 19 in order to give the New Orleans and New York cotton exchanges time to study a means of facilitating the liquidation of a single large interest without a disruptive effect upon the market. The market was reopened on October 21, and prices were further depressed to 33.45¢ a pound, owing to normal profit taking. Prices rose to 36.08¢ a pound on October 23, but crashed again to 34.00¢ on October 25; trading was suspended on the 26th. Prices continued to decline the next two days, and the exchange closed again on the 30th, with the market closing at 30.90¢ on October 31.

The futures market followed the same spiral descent. January opened on October 1 at 37.85¢ a pound and reached a 26-year high the following day and again on October 8, of 38.55¢ a pound. The day before the break, October 15, January cotton was quoted at 38.19¢ a pound. Prices during the four-day break were: 36.27¢ a pound, October 16; 34.27¢, October 17; 33.18¢, October 18 (trading was suspended on October 19) and 32.50¢ on October 21. Small recovery brought prices up to 35.16¢ on October 23, but the bottom fell out of the market again, and prices dropped to 33.02¢ on October 25. Trading was suspended on October 26. Prices fell further on the 28th and 29th, and it was again necessary to shut down trading on the 30th. January prices close at 29.90¢ on October 31.

With the plummeting of prices following the announcement of the decontrol of meat and the accelerated pace of decontrol in general, various quarters, all concerned in the cotton break, advanced diverse opinions as to the cause, including: a charge of a "well-laid plan of cotton exchanges, cotton brokers and their clients;" and that the break was the result of the years of regulation and control which had prevented the free operation of supply and demand. Economists interpreted the break as one of the first definite indications of the returning buyer's market in textiles. However normal trading returned to the market after the first one-day emergency respite from trading when arrangements were completed to relieve a New Orleans cotton operator of the remainder of his long interest.

While this crisis somewhat overshadowed other events in the market during October, some early selling was also carried on the statement by Reconversion Director John R. Steelman that continued price increases and the consequent wage price spiral would result in business and agriculture pricing itself out of the market and into a depression. Other contributing factors were the belief that planted acreage next season may show a very substantial increase over that of the current season; the surprise of mid-September cotton parity price declining to 24.80¢, off 50 points from the August 15 level (the first decline since January, 1941).

Despite these depressing factors, the crop is still in strong position statistically, with the October 1 crop estimate set at 8,724,000 bales, a decline of 477,000 bales from the September 1 forecast.

The Bureau of the Census reported that cotton consumed during September totaled 818,449 bales of lint and 74,556 bales of liners, compared with 855,511 and 86,917 bales, respectively, during August and 700,444 bales of lint and 77,488 bales of linters during September, 1945. Despite the decline in total use, daily use was up in September at a rate which, if continued, would send the staple above 40¢ as soon as the hedging season ends and before the next crop moves.

Fabrics

Further increases in textile prices continue to be the outlook for the present, according to industry opinion. Greatest influence pressing in that direction is, of course, the high raw cotton prices. Despite the break in raw cotton during October, the market is in such a strong statistical position, it is expected prices will regain the lost ground by the first of next year.

Current ceilings are set by the average price in the futures market during two weeks (from the eighth to the 22nd) of the previous month, and the decline during that period did not bring the cotton content cost sufficiently under the October cost to warrant any lower ceiling change by the OPA.

While the volume of primary market business was stepped up coincident with the break in cotton prices, additional impetus was given to sales when it became evident that present maximum prices are slated to remain unchanged.

Distributers who were awaiting the November cotton cost figure in the expectation that it would result in a higher cloth ceiling began an immediate release of goods, and mills that would have been selling only through the balance of this year are in some cases selling through the first quarter of next year. Though a great quantity of sheetings appeared, supply is found to be still tight in all industrial goods.

One factor causing the extreme shortage of textiles is the fact that mills have changed hands and are being bought by concerns with integrated set-ups so that mills formerly selling greige goods are now without sources of supply. Many mills dropped the lighter weight constructions of square woven sheetings as well as lightweight drills and are devoting their time to making fabrics which will net them a greater profit. This scarcity presents quite a problem to the footwear industry which consumes a considerable quantity of the lightweight sheeting and drills, and it is felt that these constructions will be in short supply for some time.

It is estimated 1946 production of foundation garments will exceed 11,500,000 dozen.

In regard to the raincoat trade, it appears that men's raincoats are selling as freely as formerly, but some manufacturers and retailers report that the sale of women's rainwear is lagging.

Ceiling prices for cotton linters were increased by a weighted average of 3¢ a pound by Amendment 3 to 2nd Rev. MPR 191—Cotton Linters and Fibers—effective October 1. This amendment also caused the revocation of Order No. 1 under Section 3 of 2nd Rev. MPR 191, because the industry-wide increases were granted to facilitate the production and distribution of cotton linters and to remove an impediment of the transition to a normal peacetime economy; consequently a generally fair and equitable price adjustment having been made, there was no longer a necessity for an open billing authorization.

The fourth-quarter set-aside requirements of the CPA are comparable to the third-quarter allotments. The automotive, electrical, coating, and plastics industries are slated to receive such set-asides. To stimulate a better supply of gray goods for the rubber industry a 20% set-aside was ordered on the 40-inch 56x48, 4.30-yard Class C sheetings. Nevertheless rubber manufacturers are pointing out that any possibility for expansion in operations is being curtailed by the limited supplies of these fabrics.

A tight supply in high-tenacity rayon tire yarn is due partially to the tight supply of raw cotton linters, but primarily to OPA ceiling price inequities. As a result of a 63% price increase for second cut raw linters, oil mills are expected to resume shipments to the refiners.

A feature in the United Kingdom during the past year has been a marked increase in demand for high-tenacity yarns for tire cord. This trend received stimulus by the abolition of the 6d per pound excise duty. Some of the largest spinners in this country, however, are inclined to believe that when crude rubber again becomes plentiful, the cotton yarn industry will regain a large part of the tire cord business it has lost to high-tenacity rayon.

August production of cotton fabrics increased to 183 million yards a week, from the July rate of 177.9 million yards (excluding vacation week). August output is above the previous peak of 180.7 million yards reached in June.

Fourth-quarter production of cotton broad woven fabrics is estimated at 2,350 million yards. Although this presents an increase over the third quarter of 2,210 million yards, it will not be adequate to meet industrial, food bagging, apparel, and export requirements so that set-asides will be continued to insure meeting a portion of the most essential requirements.

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RECLAIMED RUBBER

PRODUCTION of reclaimed rubber during August reached its highest point of the year, with indications of continuing high levels for succeeding months. June, July, and August figures for the reclaim industry are now available, as shown in the table below (all figures in long tons):

	June	July	August
Production	24,900	22,600	25,800
Consumption	21,700	21,400	24,250
Exports	1,400	960	1,100
Stocks (end of month)	35,300	35,600	36,100

Production of reclaim for the first eight months of this year totaled 195,340 long tons. According to the RMA, domestic consumption of reclaim for this period was 176,687 long tons, as compared with 161,633 long tons for the corresponding eight months of 1945. In addition to the record production, consumption of reclaim and end-of-month stocks in August also reached their highest levels of the year.

Although natural rubber reclaims constitute by far the greatest percentage of production, the slow, but steady increase in production of synthetic reclaims is continuing. Production schedules of several mills now call for appreciable quantities of synthetic reclaim, particularly GR-S reclaim, which is useful in augmenting depleted stocks of GR-S rubber, improving processing, and helping to insure consistency of different batches in GR-S processing. This condition can be held directly responsible for the easing of reclaimers' restrictions that governed percentages of synthetic in scrap rubber shipments.

Reclaimed Rubber Prices

	Sp. Grav.	¢ per Lb.
Auto Tire		
Black Select	1.16-1.18	7½ / 7¾
Acid	1.18-1.22	8½ / 8¾
Shoe		
Standard	1.56-1.60	8 / 8¼
Tubes		
Black	1.19-1.28	12¼/12½
Gray	1.15-1.26	13 /14
Red	1.15-1.32	13 /13½
Miscellaneous		
Mechanical blends	1.25-1.50	5¾ / 6¼

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

SCRAP RUBBER

AFTER a sluggish start reminiscent of the inactivity of recent months, the scrap market picked up noticeably early in October after reclaimers eased their stringent specifications on percentages of synthetic. Although some mills in the East were still holding limits of 10% synthetic, most of the mills were allowing up to 25%, and several mills removed all restrictions.

Concurrently reclaimers also eased their ratios of truck *versus* auto tires acceptable, and further improved the movement of scrap tires. Only a slightly better demand for tire parts was noted, with the movement of peelings and SAG scrap still very limited. Of these, improvement was reported only in natural grades, with synthetic and recap peelings finding few takers. Market conditions for miscellaneous scrap remained in the doldrums. The only price changes were for beadless tires, delivered at Akron, which rose 50¢ to a current quotation of $24.50 per net ton.

Scrap dealers, particularly in the East, reported receiving very tempting export offers and admitted that tonnages of scrap tires were moving out of the country. Hong Kong and South America were reported the most active bidders, but it was admitted that currency restrictions, shipping space facilities, etc., were limiting movement of tires for export.

Some clarification has been given of the recent CPA ruling that scrap tires bearing the markings S-7 or of equal or higher quality may be used only in the manufacture of reclaimed rubber. According to E. W. Glenn, CPA assistant director for technical operations, dealers should have no trouble in distinguishing which tires are meant in the ruling since all unmarked truck tires being currently produced meet this classification, as do unmarked prewar tires. Concerning the detrimental effect of this ruling on tire splitters by reducing available supplies, Mr. Glenn stated that ample supplies of tires suitable for splitting are available including S-6 grade tires which are practically as high in quality as the S-7 tires. He stated that the CPA ruling had been made with the full knowledge of the reclaim industry and after a thorough study of the situation. Segregation of tires should not be further complicated by not requiring S-7 or better tires to be marked, as they may be readily identified on this basis; whereas if markings were required and were scuffed during service, identification would be difficult. In reply to a question as to whether the export of scrap rubber with a specific gravity of 1.15 or less would be permitted, in view of scrap rubber definitions given in the ruling, Mr. Glenn said that such scrap could not be exported. In addition, no export market for such scrap should be particularly noted as other countries are not in so great a need for the scrap as our own.

The following are dealers' buying prices for scrap rubber, in carload lots, delivered points indicated:

	Eastern Points	Akron, O.
	(Net Tons)	
Mixed auto tires	$17.50	$19.00
Truck and bus tires	17.50	18.00
Beadless tires	23.00	24.50
S.A.G. passenger (natural)	17.50	18.00
S.A.G. passenger (synthetic)	nom.	nom.
S.A.G. truck (natural)	15.50	16.50
S.A.G. truck (synthetic)	nom.	nom.
No. 1 peelings (natural)	44.00	45.00
No. 1 peelings (synthetic)	nom.	nom.
No. 1 peelings (recap.)	37.00	nom.
No. 2 peelings (natural)	30.00	30.50
No. 2 peelings (synthetic)	nom.	nom.
No. 2 peelings (recap.)	23.00	nom.
No. 3 peelings (natural)	28.00	29.00
No. 3 peelings (synthetic)	nom.	nom.
	(¢ per Lb.)	
Mixed auto tubes	5.5	5.25
Red passenger tubes	7.25	7.25
Black passenger tubes	6.25	6.25
Black truck tubes	6.0	6.125
Mixed puncture-proof tubes	2.0	2.0
Air brake hose	nom.	nom.
Rubber boots and shoes	nom.	nom.

Compounding Ingredients—Additions and Price Changes

Accelerators, Inorganic		
Zinc oxide, commercial lb.	$0.07	/$0.105
Antioxidants		
Mekon micro-crystalline wax, amber lb.	.14	/ .16
Black lb.	.135	/ .155
Yellow lb.	.153	/ .175
Stabilite L lb.	.48	/ .50
Blowing Agents		
Sponge paste lb.	.20	
Colors, White		
Zinc oxide, commercial lb.	.07	/ .105
Eagle AAA, lead free lb.	.08	/ .0825
37% leaded lb.	.08	/ .0825
Florence Green Seal-8 lb.	.0975/	.10
Red Seal-9 lb.	.0925/	.095
White Seal-7 lb.	.1025/	.105
Horsehead XX-4, -78, -100 lb.	.08	/ .0825
XX Special 3 lb.	.08	/ .0825
Kadox-15, -7, -72 lb.	.08	/ .0825
-25 lb.	.0925/	.095
Mold Lubricants		
Aluminum stearate, precipitated lb.	.23	.285
Rubber-Glo gal.	.97	
Odorants		
Para-Dor A lb.	2.00	/ 2.50
C lb.	2.75	/ 3.25
E lb.	.25	/ .55
Plasticizers and Softeners		
Aro Lene 1980 lb.	.10	/ .20
B.R.C. No. 20 lb.	.0105/	.0115
B.R.H. No. 2 lb.	.02	/ .021
B.R.V. lb.	.03	/ .0375
Carbonex Flakes lb.	.0275/	.0325
S Flakes lb.	.03	/ .035
Plastic lb.	.0285/	.031
Cumar EX lb.	.0525	
MH lb.	.065	/ .1175
V lb.	.0975/	.1275
Flexol Plasticizer DOP lb.	.345	/ .39
3GH lb.	.56	/ .60
3GO lb.	.515	/ .60
4GO lb.	.38	/ .45
TOF lb.	.47	/ .52
Heavy resin oil lb.	.013	/ .0205
Plasticizer 1889 lb.	.565	
1919 lb.	.55	
2069 gal.	.21	/ .23
2070 gal.	.25	/ .27
Wilmac D-X lb.	.09	/ .10
Reclaiming Oils		
Bardex lb.	.0425/	.045
Bardol lb.	.02	/ .0275
B lb.	.05	/ .0525
B.R.H. No. 2 lb.	.02	/ .021
B.R.T. No. 3 lb.	.0175/	.0185
No. 4 lb.	.018	/ .02
Dispersing Oil No. 10 lb.	.0375/	.04
Heavy Resin Oil lb.	.013	/ .0205
Reinforcers, Other Than Carbon Black		
Carbonex Flakes lb.	.0275/	.0325
S Flakes lb.	.03	/ .035
Plastic lb.	.0285/	.031
Zinc oxide, commercial lb.	.07	/ .105
Retarders		
Retardex lb.	.475	
Solvents		
Skellysolve-B gal.	.105	

Trade Lists Available

The Commercial Intelligence Division of the United States Department of Commerce recently compiled the following trade lists, of which mimeographed copies may be obtained by American firms from this Division. The price is $1 a list for each country.

Chemical Importers and Dealers—Hong Kong and Shanghai.

Automotive Equipment Importers and Dealers—Bahamas; Ecuador; Jamaica; Turkey.

Electrical Supplies and Equipment Importers and Dealers—Turkey; Iraq; Australia.

Sporting Goods, Toys, and Games Importers and Dealers—Panama; Egypt and Cyprus; New Zealand.

Rubber Goods Manufacturers—Guatemala.

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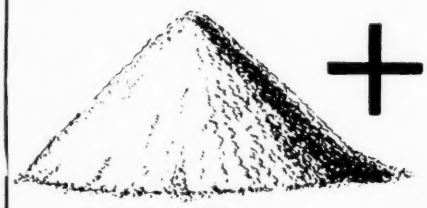

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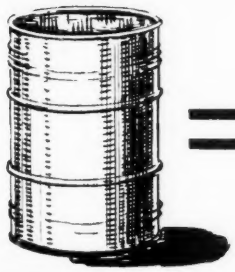

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Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	August, 1946		August, 1945	
UNMANUFACTURED	Quantity	Value	Quantity	Value
Balata ..... *lbs.*	4,751	$ 3,318	3,956	$ 1,976
Crude rubber ..... *lbs.*	7,664,285	1,465,065	2,023,748	836,292
Latex ..... *lbs.*	94,739	40,083	2,850	1,380
Rubber, powdered and waste ..... *lbs.*	1,295,900	27,778	577,800	13,670
Recovered ..... *lbs.*	1,006,200	128,467	2,139,600	154,710
Synthetic and substitute ..... *lbs.*	225,000	45,725	380,800	106,717
TOTALS.	10,890,875	$1,710,436	5,128,754	$1,114,745
PARTLY MANUFACTURED				
Hard rubber in rods or tubes ..... *lbs.*	.....	.....	810	$ 705
Rubber thread, not covered ..... *lbs*	6,436	$ 8,285	2,732	5,051
TOTALS.	6,436	$ 8,285	3,542	$ 5,756
MANUFACTURED				
Belting	.....	$ 28,430	.....	$ 49,187
Boots and shoes of rubber, n.o.p. ..... *prs.*	11,544	6,680	.....	.....
Cement	.....	33,373	.....	14,701
Clothing of waterproofed cotton or rubber	.....	1,477	.....	738
Druggists' sundries	.....	31,020	.....	18,716
Gaskets and washers	.....	20,916	.....	11,815
Gloves ..... *doz. prs.*	1,070	5,090	788	2,549
Golf balls ..... *doz.*	398	2,715	10	43
Heels ..... *prs.*	10,376	1,690	.....	.....
Hose	.....	27,305	.....	41,605
Hot water bottles	.....	3,560	.....	1,796
Inner tubes, n.o.p. ..... *no.*	3,073	11,263	176	348
Bicycle ..... *no.*	192	138	200	102
Liquid sealing compound ..	.....	19,511	.....	14,319
Mats and matting	.....	24,394	.....	632
Nursing nipples ..... *gross*	847	2,604	292	1,255
Packing	.....	19,426	.....	13,567
Raincoats ..... *no.*	4	95	.....	.....
Tire repair material	.....	27,523	.....	7,597
Tires, pneumatic ..... *no.*	7,907	204,461	223	11,314
Bicycle ..... *no.*	1,110	804	250	230
Solid for automobiles and motor trucks *no.*	.....	.....	11	562
Other	.....	2,951	.....	1,500
Other rubber manufactures	.....	226,090	.....	184,123
TOTALS.	.....	$ 701,516	.....	$ 376,699
TOTAL RUBBER IMPORTS.	.....	$2,420,237	.....	$1,497,200

Exports of Crude and Manufactured Rubber

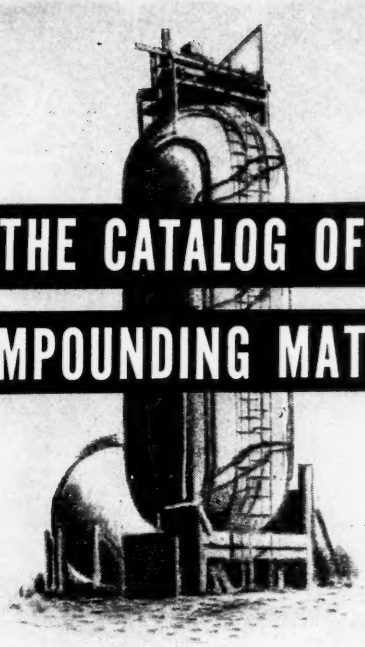
UNMANUFACTURED				
Crude rubber, including synthetic rubber ..... *lbs.*	5,701,868	$1,075,758	3,231,861	$1,241,117
Waste rubber ..... *lbs.*	1,013,000	22,270	2,250,400	31,624
TOTALS.	6,714,868	$1,098,028	5,482,261	$1,272,741
PARTLY MANUFACTURED				
Soling slabs of rubber .. *lbs.*	17,057	$ 2,643	11,090	$ 2,678
MANUFACTURED				
Bathing caps	.....	$217	.....	.....
Belting, n.o.p. ..... *lbs.*	112,674	69,301	136,618	$78,591
Belts, fan	.....	769	.....	.....
Boots and shoes of rubber, n.o.p. ..... *prs.*	201,147	318,740	121,226	201,522
Canvas shoes with rubber soles ..... *prs.*	139,404	128,885	42,576	40,362
Clothing of rubber and waterproofing clothing ..	.....	58,090	.....	13,920
Heels ..... *prs.*	27,810	2,584	125,095	17,051
Hose	.....	32,790	.....	42,468
Inner tubes for motor vehicles ..... *no.*	4,793	13,380	21,279	68,222
Soles ..... *prs.*	61,727	8,837	10,101	5,388
Tires, pneumatic for motor vehicles ..... *no.*	3,123	70,491	22,023	783,200
Other ..... *no.*	7,459	7,403	312	537
Wire and cable, copper, insulated	.....	113,535	.....	120,102
Other rubber manufactures	.....	52,219	.....	269,089
TOTALS.	.....	$ 877,241	.....	$1,637,452
TOTAL RUBBER EXPORTS.	.....	$1,977,913	.....	$2,912,871

Recent Russian Literature

(*Continued from page* 216)

Naturally the presence of traces of salts such as NaCl, K_2CO_3, etc. lowers appreciably the ignition temperature. Experiments were also carried out for determining the electro-conductivity of carbon blacks, but no correllation was found between this property and the activity of carbon black.

(*To be continued*)



FROM THE CATALOG OF BARRETT

RUBBER COMPOUNDING MATERIALS...

BARDOL*

Bardol is a distillate from coal tar. It is entirely liquid and easy to handle in the factory down to as low as 40°F.

Specifications

Specific Gravity @ 25C 25C		1.07 to 1.12
Specific Viscosity, Engler, 50 ml. @ 25C		4.0 maximum
Flash Point, Open Cup	deg. Fahr.	200 minimum
Insoluble in Benzene	% by weight	0.5 maximum
Distillation		
To 210 C	% by weight	1.0 maximum
To 235 C	"	10.0 maximum
To 300 C	"	30.0 to 60.0
To 355 C	"	60.0 minimum
Water	% by volume	1.0 maximum

Bardol is a softener and plasticizer of the solvent and swelling type. It is a particularly fine processing agent, especially for GR-S and crude rubber.

Available in: Tank cars and 50-55 gallon non-returnable steel barrels.

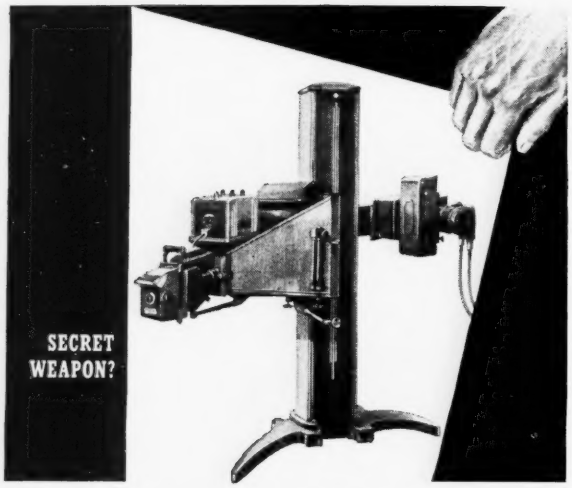
*Reg. U. S. Pat. Off.

Barrett

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N.Y.

In Canada: The Barrett Company, Ltd., 5551 St. Hubert Street, Montreal, Que.



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Christmas Seal money fights TB in many ways; one of the most important is to buy X-ray units and promote mass examinations. Please, send in your contribution today.

BUY CHRISTMAS SEALS

Because of the importance of the above message, this space has been contributed by INDIA RUBBER WORLD

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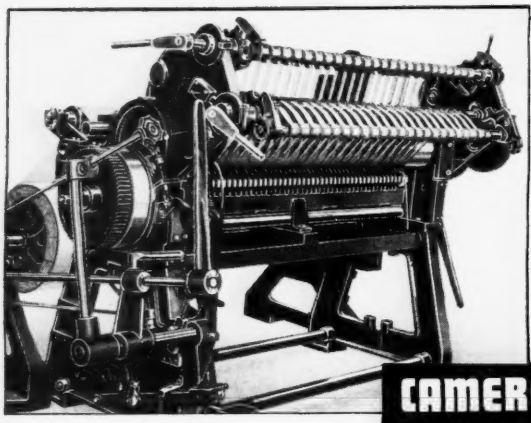

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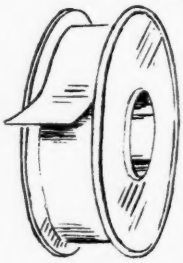
SPEEDS PRODUCTION OF SURGICAL ADHESIVE TAPE ON FLANGED ROLLS

Slits the full width of the web into measured strip, rolls the strips onto flanged spools, stops automatically at measured length, all in one operation.



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CHIPCO, INCORPORATED

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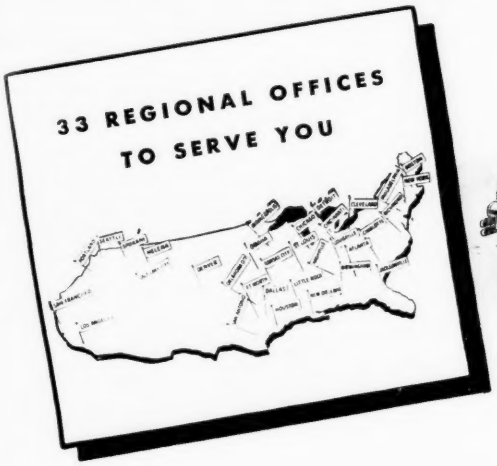

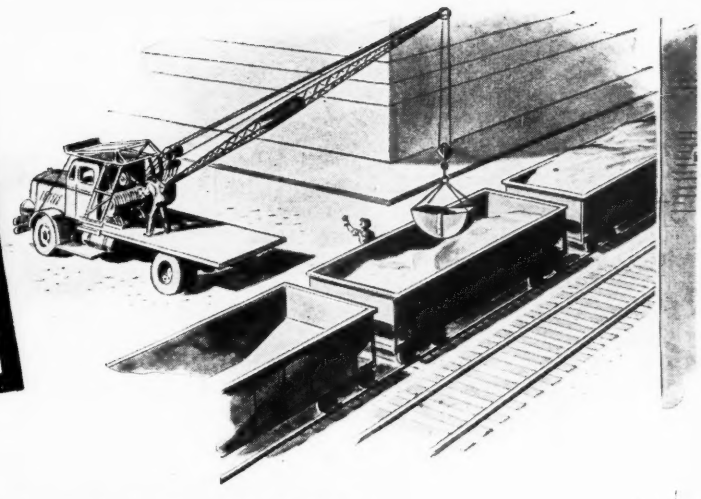

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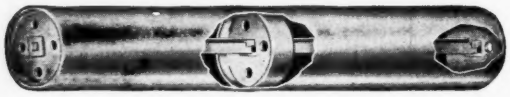

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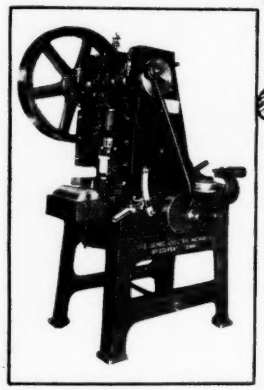

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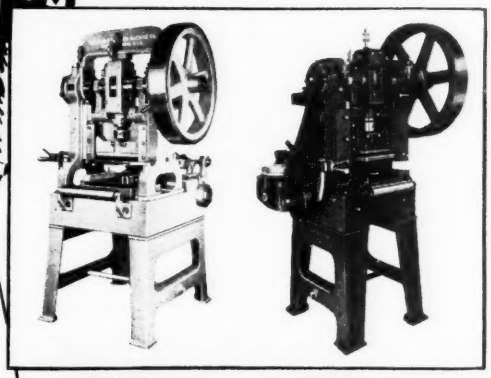
NEW Proven features for continuous volumetric control and stripping for HEELS-SOLES-TAPS and other molded products.



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Here is the *Rubber Cutting Machine* that will *cut with* or across the stock grain, either singular or in multiples—from a strip of stock direct from the warming mill.

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(Classified Advertisements Continued on Page 294)

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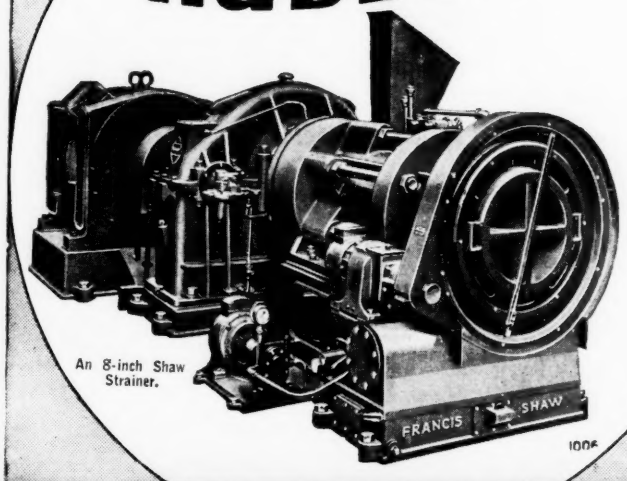

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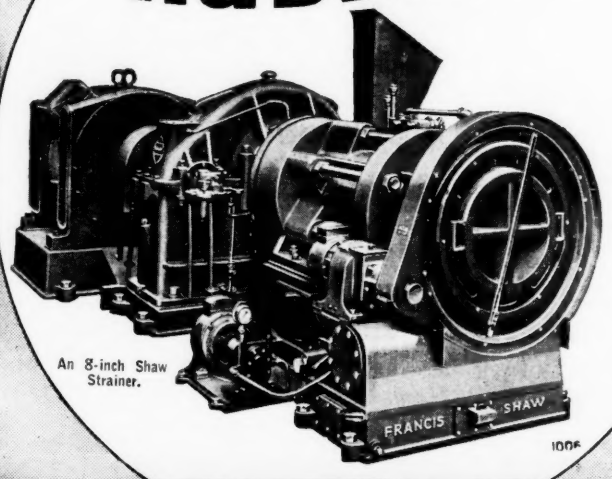

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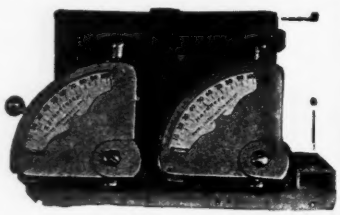

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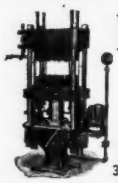

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(Classified Advertisements Continued on Page 296)

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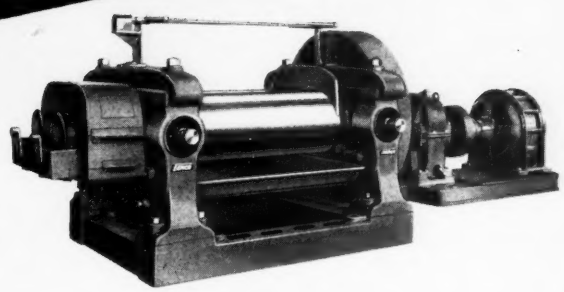

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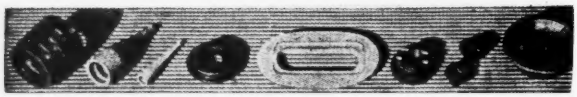

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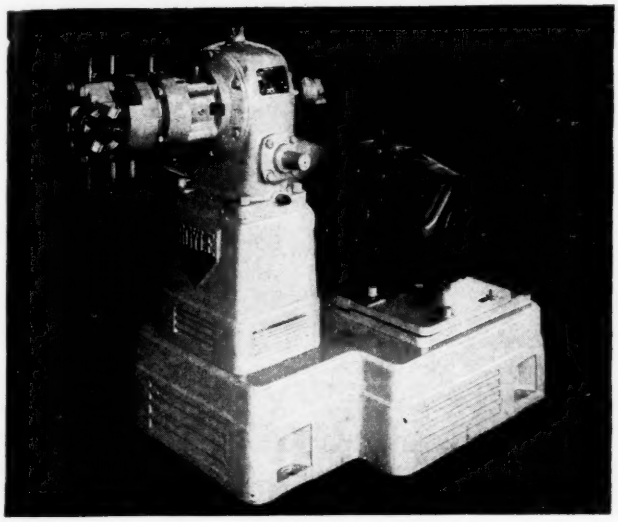

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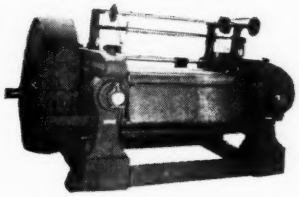

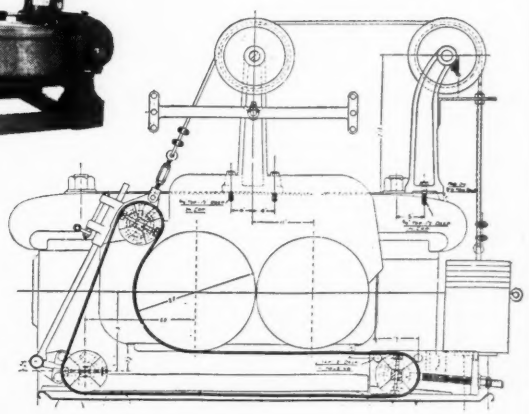

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INDEX TO ADVERTISERS

This index is maintained for the convenience of our readers. It is not a part of the advertisers' contract, and INDIA RUBBER WORLD *assumes no responsibility to advertisers for its correctness*

A

Adamson United Co. 165
Adhesive Products Corp. .. 270
Advance Solvents & Chemical Corp. 164, 263, 296
Akron Equipment Co., The 264
Akron Standard Mold Co., The 297
Albert, L., & Son. 294
Aluminum Flake Co., Inc., The 290
American Cyanamid Co., Rubber Chemicals Dept.. —
American Zinc Sales Co.. --
Ancier Products, Inc. .... --
Armour & Co., (Armour Chemical Division) .... —
Associated Engineers, Inc. 290
Atlas Electric Devices Co. 274

B

Baird Rubber & Trading Co. 268
Baker Castor Oil Co., The. 173
Baldwin Southwark Division, The Baldwin Locomotive Works 170
Barr Rubber Products Co., The 296
Barrett Division, The, Allied Chemical & Dye Corp. 285
Barry, Lawrence N. 294
Beacon Co., The..... 193
Bell Telephone Laboratories 187
Berlow and Schlosser Co. 290, 296
Biggs Boiler Works Co., The 174
Binney & Smith Co., Insert 241, 242
Black Rock Mfg. Co..... 272
Bonwitt, Eric 294
Brockton Tool Co..... 294
Brooklyn Color Works, Inc. 294

C

Cabot, Godfrey L., Inc., Front Cover
Caldwell Co., The..... 273
Cambridge Instrument Co., Inc. 263
Cameron Machine Co..... 288
Canfield, H. O., Co., The. 284
Carbide & Carbon Chemicals Corp. 166
Carter Bell Mfg. Co., The. 277
Chapco, Inc. 288
Claremont Waste Mfg. Co. 258
Cleveland Liner & Mfg. Co., The .....Back Cover
Colonial Insulator Co., The 262
Columbian Carbon Co., Insert 241, 242
Continental Carbon Co.... —
Continental-Mexican Rubber Co., Inc. 290
Coulter, James, Machine Co., The 291
Curran & Barry..... 279

D

Day, J. H., Co., The..... --
Diamond Metal Products Co. 262
Dispersions Process, Inc... —
Dow Corning Corp..... 265
Dunning & Boschert Press Co., Inc. 294
du Pont, E. I., de Nemours & Co., Inc..Inside Front Cover

E

Eagle-Picher Co., The.... 284
Erie Engine & Mfg. Co... 295
Erie Foundry Co..... 255

F

Farrel-Birmingham Co., Inc. 201
Flexo Supply Co., Inc... 271
Flintkote Co., The..... 191
French Oil Mill Machinery Co., The..... 278

G

Galey Manufacturing Co.. 256
Gammeter, W. F., Co., The 290
General Atlas Carbon Co.. 176
General Chemical Co..... 179
General Latex & Chemical Corp. 194
General Magnesite & Magnesia Co..... —
General Tire & Rubber Co., The 290
Genseke Brothers ..... —
Gidley, Philip Tucker..... 296
Givaudan-Delawanna, Inc.. 293
Goodrich, B. F., Chemical Co. (Chemicals) 163
Goodrich, B. F., Chemical Co. (Hycar) 159
Goodyear Tire & Rubber Co., Inc., The..... 169

H

Hall, C. P., Co., The.... 261
Hardesty Chemical Co., Inc. 283
Hercules Powder Co., Inc.. —
Herron Bros. & Meyer..176, 192
Heveatex Corp. ..... —
Hoggson & Pettis Mfg. Co., The 260
Home Rubber Co..... 288
Howe Machinery Co., Inc.. 296
Huber, J. M. Inc..... 202

I

Industrial Rayon Corp.... 181

J

Jacoby, Ernest, & Co.,.... —
Johnson Corp., The..... 267

K

Karman Rubber Co..... 290
Keasbey & Mattison Co... —

L

Littlejohn & Co., Inc.... 258
Loewenthal Co., The..... 184
Ludlow-Saylor Wire Co., The ..... —

M

Magnetic Gauge Co., The. 269
Marbon Corp. 276
Marine Magnesium Products Corp. 275
Martin Rubber Co..... 296
McNeil Machine & Engineering Co., The..... —
Meyer & Brown Corp.... —
Monsanto Chemical Co.... 257
Moore & Munger..... 287
Muehlstein, H., & Co., Inc. —
Mumper, James F., Co., The 294

N

National-Erie Corp. ..... —
National Lead Co..... 200
National Rubber Machinery Co. ..... —
National Sherardizing & Machine Co., The..... 296
National-Standard Co. ... 196
Naugatuck Chemical, Division of U. S. Rubber Co. 161, 175
Neville Co., The 195
New England Butt Co..... 274
New Jersey Zinc Co., The. 188

O

Oak Rubber Co., The..... 270

P

Pennsylvania Industrial Chemical Corp. 197
Pequanoc Rubber Co..... —
Phillips Petroleum Co. (Chemical Products Dept.) 171
Phillips Petroleum Co. (Philblack Division)..160, 256 269, 279
Pittsburgh Plate Glass Co., Columbia Chemical Division 183
Polymel Corp., The..... —
Precision Scientific Co.... 186
Pyrometer Instrument Co., The ..... —

R

Rand Rubber Co..... —
Rare Metal Products Co.. 278
Rayon Processing Co. of R. I., Inc. ..... —
Resinous Products & Chemical Co., The..... 177
Revertex Corporation of America ..... —
Ridbo Laboratories, Inc... —
Robertson, John, Co., Inc. —
Rohm & Haas Co..... —
Royle, John, & Sons..... 297

S

St. Joseph Lead Co..... —
Schulman, A., Inc.. Inside Back Cover
Scott Testers, Inc..... 178
Sharples Chemicals, Inc... —
Shaw, Francis, & Co., Ltd. 293
Shell Oil Co., Inc..... —
Shore Instrument & Mfg. Co., The 294
Skelly Oil Co..... 182
Snell, Foster D., Inc..... 296
Socony-Vacuum Oil Co., Inc. ..... —
Southland Cork Co..... 296
Spadone Machine Co..... 260
Stamford Rubber Supply Co., The 288
Stanco Distributors, Inc... 251
Standard Chemical Co.... 189
Standard Oil Co. of N. J. 185
Standard Oil Co. (Indiana) 199
Stanley Chemical Co., The —
Stauffer Chemical Co..... 295
Stein, Hall & Co., Inc.... 180
Struthers Wells Corp..... --
Sun Oil Co..... 253
Symons, Ralph B..... 296
Synthetic Adhesives, Inc.. 266

T

Taber Instrument Corp.... 268
Tanney-Costello, Inc. .... —
Taylor Instrument Cos.... —
Textile Proofers, Inc..... —
Thropp, William R., & Sons Co. ..... —
Timken Roller Bearing Co., The 259
Titanium Pigment Corp.... 172
Turner Halsey Co..... —

U

Union Bay State Chemical Co. 198
Union Pacific Railroad.... 162
United Carbon Co., Inc., Insert 167, 168
United Engineering & Foundry Co. ..... —
United Rubber Machinery Exchange 294
U. S. Rubber Reclaiming Co., Inc. ..... —

V

Valvair Corp. 264
Vanderbilt, R. T., Co., Inc. 204

W

Wade, Levi C., Co..... —
Wanted and For Sale, 292, 294, 296
War Assets Administration 289
Warwick Chemical Co..... —
White, J. J., Products Co. 291
Whittaker, Clark & Daniels, Inc. ..... —
Williams, C. K., & Co., Inc. 290
Wilson, Charles T., Co., Inc. 266
Witco Chemical Co. (formerly Wishnick-Tumpeer, Inc.) 281
Wood, Chas. E., Inc..... 272
Wood, R. D., Co..... 190

Y

Yarnall-Waring Co..... 276

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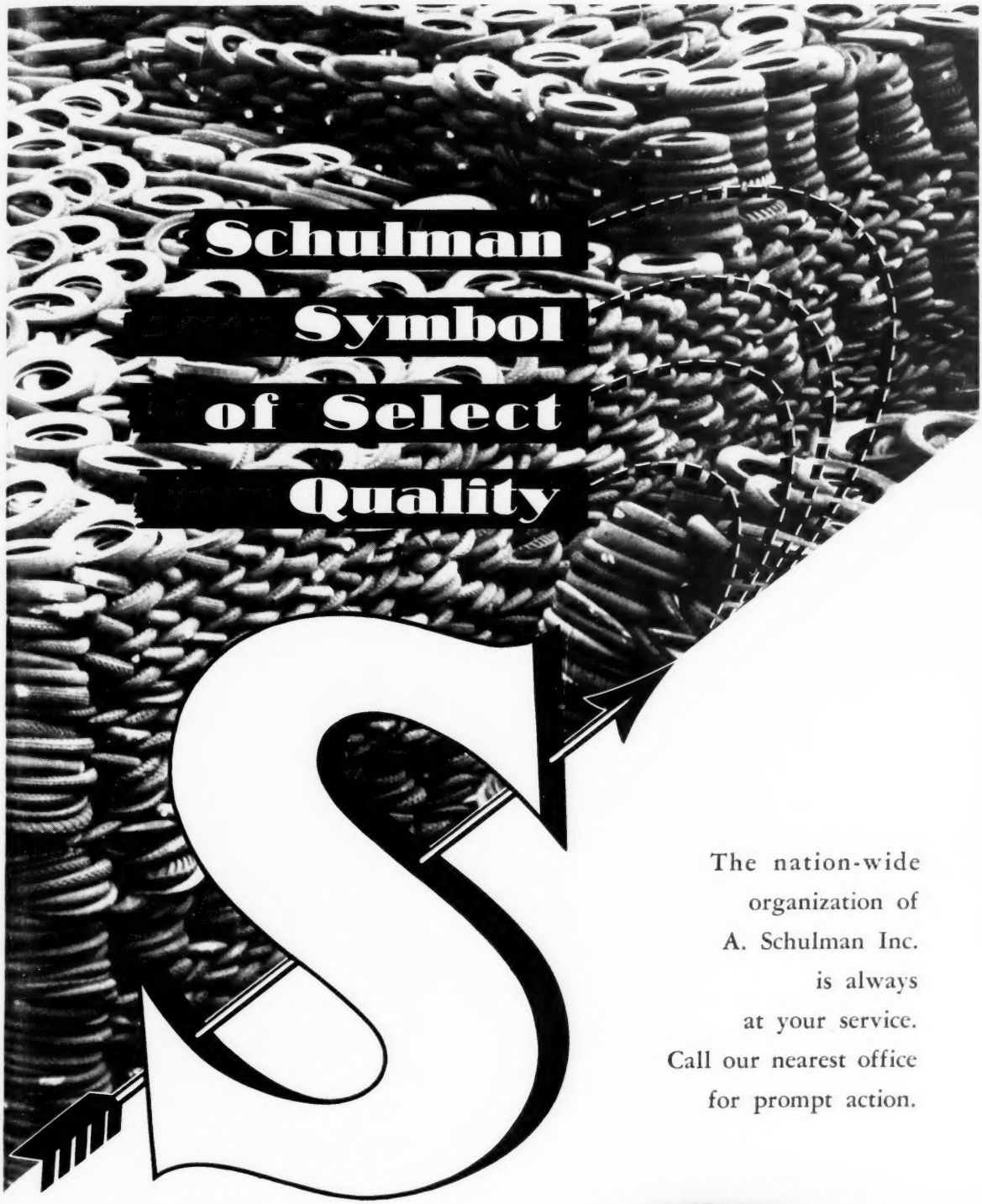

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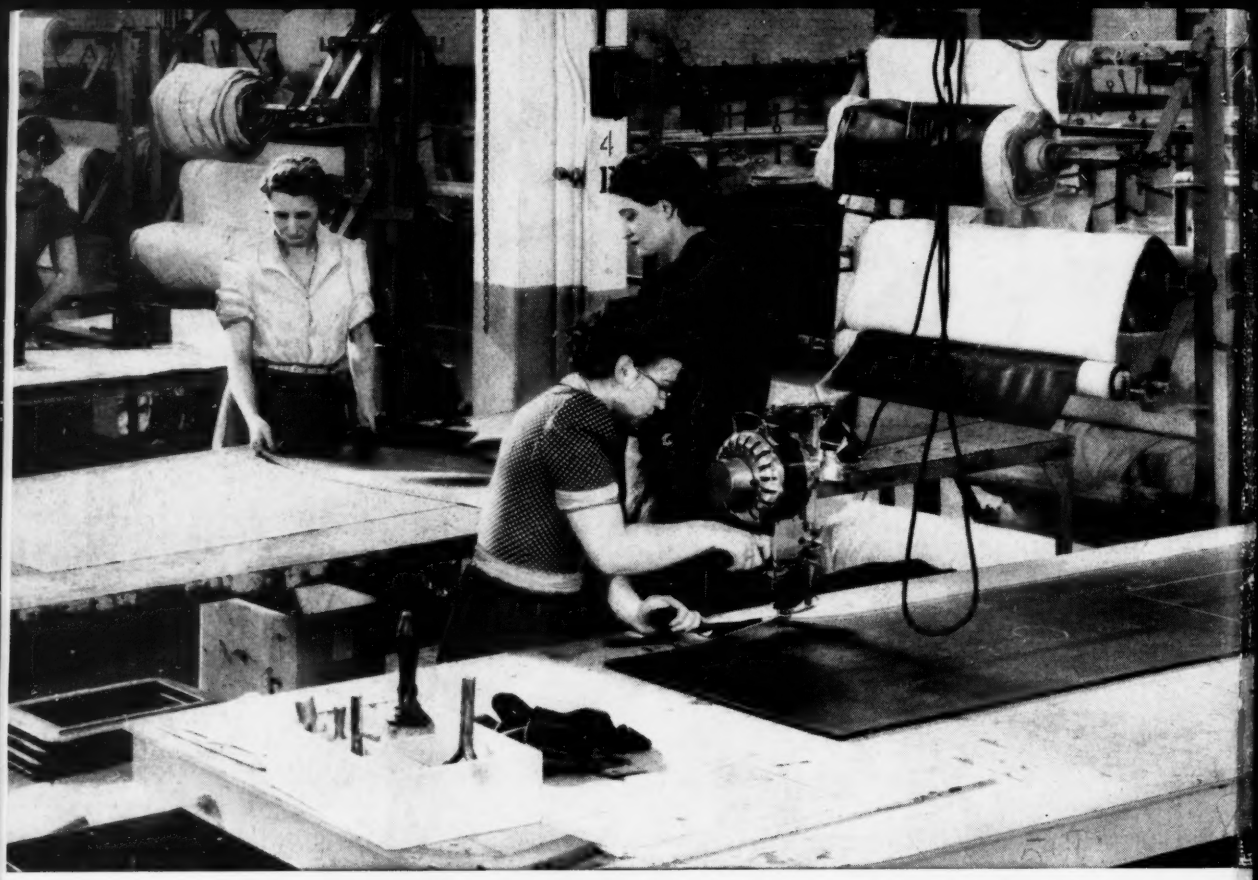

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